THE PROFESSIONAL GEOGRAPHER

OF MICHIGAN
JUL 13 1961
LIBRARY

SPACE AND PROCESS
J. M. Blaut, *Yale University*

TOWARD A MORE LITERARY GEOGRAPHY
Barry N. Floyd, *Dartmouth College*

CLIMATOLOGY AND GEOGRAPHERS
Llewelyn Williams, *Quartermaster Research and Engineering Command*

MEASURING RESORT POPULATION INCREASES
Richard B. Erickson, *Cape May County Planning Board*

LANDFORMS ASSOCIATED WITH STAGNANT GLACIAL ICE
Harold A. Winters, *Northern Illinois University*

CHANGING THE STYLE OF MECHANICAL LETTERING
James A. Bier, *University of Illinois*

WHEN AND HOW SHOULD WE VISUALIZE?
Howard C. Koverman, Jr., *Olin Mathieson Chemical Corporation*

BEWARE OF DIAGONAL LINES IN BAR GRAPHS
Gwen M. Schultz, *University of Wisconsin*

SOME THOUGHTS ON GEOGRAPHY OF THE FUTURE
Lane J. Johnson, *Wayne State University*

THIS COLUMBUS-CAICOS CONFUSION
Edwin Doran, Jr., *Agricultural and Mechanical College of Texas*

ASSOCIATION AFFAIRS

ANNOUNCEMENTS AND REPORTS

COMMUNICATIONS FROM READERS

NEW PUBLICATIONS

Journal of
The Association of American Geographers
Phyllis R. Griess, Editor
George F. Deasy, Associate Editor

Volume XIII July 1961 Number 4

ASSOCIATION OF AMERICAN GEOGRAPHERS

OFFICERS

Honorary President
C. Warren Thornthwaite
Laboratory of Climatology
Elmer, N. J.

President
Jan O. M. Broek
University of Minnesota
Minneapolis 14, Minn.

Vice President
Gilbert F. White
University of Chicago
Chicago 37, Ill.

Secretary
Meredith F. Burrill
Department of Interior
Washington 25, D.C.

Treasurer
George F. Deasy
Pennsylvania State University
University Park, Pa.

COUNCILORS

Past President
Paul A. Siple
Department of the Army
Washington 25, D.C.

Fred B. Kniffen
Louisiana State University
Baton Rouge 3, La.

Alfred H. Meyer
Valparaiso University
Valparaiso, Ind.

James J. Parsons
University of California
Berkeley, Calif.

G. Etzel Pearcy
2117 E Street, N.W.
Washington 7, D.C.

Arthur H. Robinson
University of Wisconsin
Madison 6, Wis.

Kirk H. Stone
University of Wisconsin
Madison 6, Wis.

EDITORS

ANNALS

Editor
Robert S. Platt
University of Chicago
Chicago 37, Ill.

Assistant Editor
Marvin W. Mikesell
University of Chicago
Chicago 37, Ill.

Book Review Editor
Marion E. Marts
University of Washington
Seattle 5, Wash.

Map Supplement Editor
Richard Edes Harrison
315 East 51st Street
New York 22, N.Y.

THE PROFESSIONAL GEOGRAPHER

Editor
Phyllis B. Gries
Pennsylvania State University
University Park, Pa.

Associate Editor
George F. Deasy
Pennsylvania State University
University Park, Pa.

MONOGRAPH SERIES

Editor
Andrew H. Clark
University of Wisconsin
Madison 6, Wis.

DIVISION CHAIRMEN

New England - St. Lawrence
Henry J. Warman
Clark University
Worcester, Mass.

New York - New Jersey
Robert B. McNee
City College
New York, N.Y.

Middle Atlantic
John L. Taylor
7311 16th Place
Hyattsville, Md.

Southeastern
William M. Pierson
University of Florida
Gainesville, Fla.

East Lakes
Ralph W. Frank
Bowling Green State Univ.
Bowling Green, O.

West Lakes
Wilmar Zelinsky
Southern Illinois University
Carbondale, Ill.

Great Plains - Rocky Mountains
Robert P. Murphy
Ft. Hays State College
Hays, Kan.

Southwestern
John W. Morris
University of Oklahoma
Norman, Okla.

Pacific Coast
Marion E. Marts
University of Washington
Seattle, Wash.

THE PROFESSIONAL GEOGRAPHER

VOL. XIII, No. 4 JULY, 1961

CONTENTS

SPACE AND PROCESS . . . . . *J. M. Blaut* 1

TOWARD A MORE LITERARY GEOGRAPHY . . . . . *Barry N. Floyd* 7

CLIMATOLOGY AND GEOGRAPHERS . . . . . *Llewelyn Williams* 11

MEASURING RESORT POPULATION INCREASES . . . *Richard B. Erickson* 16

LANDFORMS ASSOCIATED WITH STAGNANT GLACIAL ICE . . . . . *Harold A. Winters* 19

CHANGING THE STYLE OF MECHANICAL LETTERING . . *James A. Bier* 23

WHEN AND HOW SHOULD WE VISUALIZE? . . *Howard C. Koverman, Jr.* 26

BEWARE OF DIAGONAL LINES IN BAR GRAPHS . . . . *Gwen M. Schultz* 28

SOME THOUGHTS ON GEOGRAPHY OF THE FUTURE . . *Lane J. Johnson* 30

THIS COLUMBUS-CAICOS CONFUSION . . . . . *Edwin Doran, Jr.* 32

ASSOCIATION AFFAIRS

Preliminary Program, AAG 1961 East Lansing Meetings 35

Housing Accommodations at East Lansing 41

Transportation Costs to East Lansing 42

ANNOUNCEMENTS AND REPORTS

Travel Study and Geography Field Trips in Europe . . . . *J. S. Haupert* 43

News from Geographic Centers 46

Other Items 50

COMMUNICATIONS FROM READERS 53

NEW PUBLICATIONS 54

The Professional Geographer, Journal of the Association of American Geographers, 1785 Massachusetts Ave., N.W., Washington 6, D.C., is published bimonthly at Commercial Printing, Inc., State College, Pa. Annual subscription $5.00; single copies 85 cents (except special issues). Editor, Phyllis R. Griess; Associate Editor, George F. Deasy: Department of Geography, The Pennsylvania State University, University Park, Pa. Second class postage paid at University Park, Pa. **Postmaster: return undeliverable copies to Association of American Geographers. 1785 Massachusetts Ave., N.W., Washington 6, D.C., return postage for which is guaranteed.**

The Association and The Professional Geographer

The Professional Geographer *serves as an outlet for short scholarly articles, reports on activities of the Association, announcements concerning other items of interest to the geographic profession, and as an advertising medium for products of use to the geographer.*

The Association also publishes the Annals, *which contains longer scholarly articles, presidential addresses, book reviews, and map supplements. Other, non-periodical, publications of a professional nature are published by the Association.*

Subscription and Advertising Information

The annual subscription rate to The Professional Geographer *is $5.00 and the single copy rate is 85 cents (except special issues), both payable in advance. Send all subscriptions and orders to the Central Office Manager, Association of American Geographers, 1785 Massachusetts Avenue, N.W., Washington 6, D.C. Make all remittances payable to the Association of American Geographers.*

Notification of change of address by subscribers should be sent to the Central Office Manager. Notice should be given at least four weeks in advance, and should include both old and new addresses.

Advertising in The Professional Geographer *is restricted to products of interest or importance to the geographic profession. Address all correspondence relating to advertising to the Central Office Manager.*

Suggestions to Contributors

The Editors of The Professional Geographer *invite submittal of manuscript of a character similar to that included in the present and recent issues. All manuscript, including articles, announcements, reports, and footnotes, should be typed double-spaced with wide margins on 8½ inch by 11 inch bond paper, one side only, and should be carefully edited by the author. Organization, capitalization, and other aspects of style should conform to standards employed in this periodical. Tables should be typed separately and be double-spaced. Line drawings should be in condition suitable for reproduction at either one- or two-column size and should be captioned. Halftone illustrations cannot be accepted.*

Authors of articles must restrict the length of their manuscripts, including headings, line drawings and captions, tables, and footnotes, to an amount equivalent to six pages of this periodical. In order to facilitate maximum use of available space, authors of articles are requested to bracket in red pencil short passages which may, if necessary, be omitted by the Editors. A limited number of bibliographical footnotes is permitted with each article, but informational footnotes cannot be accepted. Footnotes should be placed at the end of the article, should be keyed into the article when necessary with numbers enclosed in parentheses, and should follow the style employed in this publication.

Authors of announcements and reports concerning Association affairs and other items of interest to geographers are requested to be concise in their writing, and to submit materials in a form suitable for publication. The Editors will not include such materials if extensive rewriting is necessary. The Editors reserve the right to reduce the length of, or refuse to accept, such materials as are believed to be unnecessarily long or of little interest to readers. Space limitations may prevent publication of all announcements and reports submitted, but manuscripts will not be returned. Announcements and reports must be received by the first day of the month preceding month of publication.

It is strongly urged that carbon copies of all manuscript, and photo copies of all line drawings, be retained by authors. The Editors assume no liability for loss of, or damage to, materials submitted for publication.

All materials submitted for publication, and all books for review, should be sent to Dr. Phyllis R. Griess, Editor, The Professional Geographer, *Department of Geography, The Pennsylvania State University, University Park, Pa. The Editors and the Association of American Geographers assume no responsibility for statements or opinions expressed by contributors.*

THE PROFESSIONAL GEOGRAPHER

VOLUME XIII JULY 1961 NUMBER 4

SPACE AND PROCESS*

J. M. Blaut

Yale University

"SPACE," said Whittlesey, is "the basic organizing concept of the geographer." *(1)* But space is a treacherous philosophical word, and every empirical and metaphysical notion of pure, timeless space has been discarded by scientific philosophy. Where, then, does geography stand?

Root concepts. The Greek Atomists reduced everything to permanent bodies drifting and colliding in empty space, the Void. Thus arose the notion of absolute space as a distinct, physical, and eminently real or empirical entity in itself. *(2)* This doctrine became enshrined in the cosmology of Newton, with its "absolute space in its own nature . . . always similar and immovable" and its "absolute, true, and mathematical time." *(3)* Newton believed in "a space composed of points, and a time composed of instants, which had an existence independent of the bodies and events that occupied them." *(4)* This existence was physical, not abstract or mental: Newtonian space propagated light and conveyed forces, and was "the sensorium of God." But it was timeless and immaterial.

Opposing the absolutist doctrine was that of relative space, the idea that space by itself is inconceivable: "What is empty is nothing. What is nothing cannot be." *(5)* Apparently even older than the belief in absolute space, the relativist doctrine seems to derive from pragmatic concepts of measurement. The Sumerians, for example, viewed "areal extension . . . from the anthropocentric aspect of the labor involved." *(6)* The relative concept of space as merely a relation between events or an aspect of events, and thus bound to time and process, was later elaborated by Leibniz, whose philosophy of space "forms the basis of the [modern] theory of relativity." *(7)*

Philosophers down through Kant and the German Idealists sought to weave metaphysical theories around the idea of space. Some, including Aristotle, tried to mediate between absolute and relative space by denying empirical reality to space, and instead granting it metaphysical reality as pure form, conceptually, if not physically, distinct from time and matter. *(8)* Others, believing wholeheartedly in absolute space, tried to establish the belief as necessarily, aprioristically true. Among these was Immanuel Kant.

Spatial extension, according to Kant, is not a property of the things of the external world, but is assigned to incoming sense-data by the transcendental outer sense, the intuition (*Anschauung*) of space. Next, the inner sense, the *Anschauung* of time, separately assigns them temporality. Finally, they are led into the "understanding," where the Kantian categories attach to them the "concepts"—causality, individuality, substance, and so forth. These processes are transcendental rather than psychological, and space is thus a fusion of synthetic (empirical, non-logical) perception and an *a priori* "form of the understanding." Implicit in this view are the complete separation of space and time and causality; the synthetic, nonlogical nature of Euclidean geometry; the metaphysical, rather than physical, basis of absolute space; and the divisibility of sciences into those of the outer sense, presenting Nature in space, the inner sense, presenting Soul or Mind in time, and the faculty of pure reason, telling us what a thing really is. *(9)*

The post-Kantian German Idealists were heavily influenced by Kant, but sought to soften his doctrine of the synthetic *a priori*, and thus of absolute space and time. Schelling, in particular, rejected Kant's opposition of outer to inner, Nature to Soul, and partly

reunited space and time. Schelling's Romantic panpsychism extended Mind to the whole universe, and Mind implied time. Continuity, life, and progress were central to his philosophy, and space became scale, or breadth, or striving outward, or unity in diversity. But Romantic Idealism was more poetic than convincing, and could not survive counterattack by the Neo-Kantians (e.g., Windelband) and by Newtonian science. *(10)*

The 19th century was therefore dominated by what Whitehead calls "the intellectual 'spatialization' of things" *(11)*, science holding with the absolute space of Newton and philosophy with the even more absolute space of Kant. During this same period, however, non-Euclidean geometries were throwing into question the synthetic *a priori;* advances in logic, epistemology, and psychology were showing Kant's transcendental theory of knowledge to be bad psychology rather than good metaphysics; and Newtonian space was succumbing to new physical theories. Long before Einstein, in fact, the relativistic revolution had been set in motion. By the beginning of the present century, absolute space had been discarded throughout most of science and philosophy. Today, says Poincare, "whoever speaks of absolute space employs a word devoid of meaning." *(12)*

Relative space is inseparably fused to relative time, the two forming what is called the space-time manifold, or simply *process.* Nothing in the physical world is purely spatial or temporal; everything is process. The time dimension may be neglected, but it is always implied. Pure space cannot even survive as an empirical abstraction: it is not, after all, a quality like color (are there non-spatial qualities?), or a class (are there non-spatial classes?), or even a concept (can a concept be devoid of meaning?). Pure space is in fact relegated to pure mathematics, and *every empirical concept of space must be reducible by a chain of definitions to a concept of process.* Thus, for example, a word like area either signifies process—a spatio-temporal segment of process or the operation of measuring it—or it signifies some entirely non-empirical, mathematical construct. Even the concept of simultaneity (as between two events on a map) loses its apparent meaning as a timeless slice of space. Simultaneity implies space-time overlap, the coordination of two or more space-times to a single frame of reference—e.g., by sending a message from one event to a second, receiving a reply, and recording the second as existing during a specified interval in the space-time of the first. This relation is obviously not timeless. *(13)*

Geographic concepts. Methodological issues, Hartshorne reminds us, often boil down to "different interpretations placed on ambiguous words." *(14)* The word space is nothing if not ambiguous, and some very fundamental disputes turn on its meaning. An attempt at clarification thus seems in order.

Consider the following spatial expression: space and other geometric terms have been appropriated by geography to designate segments of the earth at its surface. Thus we, as geographers, refer to spaces and areas and *Erdraume,* and argue that geography is the study of areas or is concerned with areas. Sometimes, also, area is used to describe a physical surface, usually the surface of the land. We speak further of physical distances, and of places, positions, and points on the earth's surface. Space-word expressions like these have been current at least since Humboldt and Ritter. Ritter spoke of *irdisch erfullten Raume* and Humboldt of the *Raum-erfullenden (15),* and ever since geographers have employed phrases assigning properties (usually logical predicates) to space-words, thus: the content of area; things in space; phenomena of area. Other expressions labelled spatial indicate some connection between discrete phenomena, but a connection which is somehow spatial, thus: space relations; distance relations; spatial association; Michotte's principle of extension. *(16)* Still other expressions refer to spatial qualities as properties: the spatial aspect of something; the location of X; Marthe's *raumlich . . . erscheinende Qualitaten an den Objekten* and De Geer's abstract spatial qualities *(17);* and numerous ideas of the spatial form or morphology of something. An additional group of expressions ties space to one or another notion of cause, or force, or explanation, thus: the factor of distance; locational element; spatial variable; the significance of space; and, of course, the old *Raumbeeinflussung, Raum als Schicksal,* and the like, of the geopoliticians. *(18)* Then there are spatial expressions indicating scale or size, externality or environment, uniqueness, and any number of other things. The list is neither complete nor systematic, because

these are not genuine, precisely defined concepts; instead, they are merely expressions employing space-words, and they can be interpreted almost as one chooses. If given absolutistic interpretations, they become meaningless or metaphysical pseudo-concepts. *(19)* No sensible debate can be generated by a pseudo-concept of space, and certainly no such notion can serve as geography's basic organizing concept.

Absolutistic interpretations lead in two directions: toward belief in the existence of a Newtonian space, timeless, objectless, but physical; and toward belief in Kant's or some other metaphysical space. The first interpretation is particularly alluring to geographers, because it seems to provide us with space *as subject matter*, allowing us to imagine that a sentence of the form "Geography is a science of space" has the same kind of meaning as verbally equivalent sentences about other sciences – botany as the science of plants, geology as the science of rocks, and so forth. Few geographers have carried such interpretations to the extreme of setting up a category of phenomena made up only of pure space, but many have talked about timeless, immaterial space as though it were real and substantial enough to be viewed and studied empirically. All that seems to be required is a belief that withdrawing the temporal dimension from a section of reality, along with all objects, somehow leaves a something spatial behind for the geographer to study. One source of this belief is the structure of common-sense language: when we speak of something as *in* space, or of the content *of* space, it is a simple enough matter to assume that space—rather like the Cheshire Cat's grin—remains after the contents have been removed. *(20)* Another source is the Newtonian idea of space as empty-but-with-mysterious-properties, a legacy from 19th century science. Still another source is our unfortunate habit of expressing ideas about simultaneity in terms of slices and cross-sections. If, as it were, we slice through time at one timeless instant, we do *not* get a purely spatial cross-section; we get nothing at all. *(21)* Another source is the spurious spatiality of maps. The map-thing, the ink-on-paper sign-vehicle itself, is of course relatively unchanging, and beguiles us into imagining that the map-meaning, the signification of the map, is something other than process. Further confusion is added by the fact that maps portray simultaneity directly, pictorially, whereas time-depth is represented only (in most cases) by inference.

Newtonian notions of absolute space are far from uncommon in geographical literature. The interested reader will, I think, find various ideas of the following sorts: space as a real, perceptible quality; as a phenomenon separable from time and matter; as a causal force; and as a concept of distance which is neither one of measurement nor process-connection nor scale. Such ideas are asserted by Marthe, De Geer, Grano, Losch, many geopoliticians, Huntington and other environmentalists (whose characteristic error was that of mistaking proximity for influence), and Warntz, to name a few exponents of absolutism. *(22)* Lukermann's analysis of the Newtonian assumptions in Warntz's writings is particularly instructive. *(23)*

The arguments against Newtonian absolute space were summarized previously, and only the methodological consequences need be criticized here. Any concept of space which refers to the empirical world, i.e., is not purely analytic (mathematical), must either be a concept of spatio-temporal process or one of measurement. Thus, *Erdraum* is at the same time *Erd-Zeitraum;* and the geographer's geomer, compage, or total integration is indistinguishable from the historian's term period except in what things he looks for—i.e., in subject matter. The content of area *is* the area. Sequent-occupance stages, where they exist, and all successive present-day geographies fit neatly together, as Hartshorne has emphasized, into a continuous process. *(24)* Space relations, if expressing only distances-apart, are simply reports of direct or indirect measurement; if meant as an indication of influence *across* distance, they translate into the spatio-temporal flow of events *through* distance—what Isard calls, in one context, "the friction of physical distance." Spatial factors and spatial variables may be impinging, external (environmental) factors or variables, or they may simply be impressively extensive processes, but they remain, nevertheless, ordinary causal (or conditioning) variables.

With only moderate injustice to Kant, we can label as Kantian any metaphysical notion of absolute space. Kant's own view of space leads directly into his conception of geography, his argument running about as follows: knowledge about the spatial lo-

cation of objects is quite distinct from knowledge about their true nature and the natural laws governing them. The latter sorts of knowledge are eternal and universal, are truly scientific, and arise from the "understanding," which, as we have seen, supplies the required *a priori* "concepts." Thus, space and time coordinates are separate and rather secondary attributes of objects, and spatial and temporal arrangement of objects is not a matter for science, but for natural history —the "systematic presentation [of natural things] at different times and in different places" *(25)*, which, says Kant, is merely a propaedeutic or introduction to true scientific knowledge. According to this schema, geography cannot be concerned with identification, classification, generalization, or explanation; these are functions of the "understanding." Rather, geography deals with spatial arrangement: "geographical description of nature shows where [things] are to be found on earth." *(26)* Since it deals only with things which *nebeneinander liegen*, which are simultaneous, geography is not properly comparative. Since it is tied to the outer sense, it is artifically segregated from social science, as Ratzel has noted. *(27)* If we deny validity to Kant's curious idea of space, and even more curious idea of object, the entire schema collapses; the spatial aspect and the true nature of things simply cannot be separated. That Kant's theory, even so, has aided the growth of geographic thought probably reflects the unconscious substitution of relativistic spatial concepts for Kantian ones by later methodologists (and sometimes by Kant himself!): a measurement concept transforms the Kantian schema into a fair definition of cartography; perhaps also of the most descriptive regional geography. A concept of process transaction yields at least the rudiments of modern explanatory geography.

Structure and process, form and matter, being and becoming—each of these ancient metaphysical oppositions is woven into the contrast between spatial morphology and the content of space, between, on the one hand, a kind of permanent and rigid spatial framework, distinct from the material world yet providing it with shape and pattern, purely geometric yet somehow registering on maps, and, on the other hand, the flux of changing process. This contrast between spatial structure and process is essentially Kantian, but also derives in part from Goethe's rather Platonic conception of morphology as persistence, permanence-amidst-change, of form (e.g., the archetypal plant), and in part from the Kant- and Goethe-influenced spatial ideas of Windelband and other post-Kantians. *(28)* The notion of space involved here is absolutistic in a metaphysical rather than a physical sense, because space is not viewed as an existent, physically separable from process, but as an aspect of process which is apprehended in a different and mysterious way, and by a different kind of empirical science. Those who believe that geography is concerned with spatial morphology generally accord it the strange Kantian status of a mathematical (analytic) discipline which is nevertheless empirical (synthetic). Thus, W. Cramer spoke of geography as "exclusively concerned with form," as an "entirely mathematical discipline." Krebs adopted a similar position, to which Sauer at one time seems to have been attracted. *(29)* Of many other arguments along the same lines, the most recent is that of Schaefer, who attempted the impossible task of supporting a Goethean position with Positivist arguments. Apparently misinterpreting Bergmann's valid distinction between process laws and cross-section laws (laws about simultaneous processes, but nonetheless processes), Schaefer claimed that geography is essentially morphological, that its laws contain no reference to time and change, that it is concerned with "the spatial arrangement of phenomena . . . and not so much . . . the phenomena themselves," with "spatial relations . . . and no others." *(30)*

All of these views assume that structure and process are two different things, which they are not; structures of the real world are simply slow processes of long duration *(31)*, the more slowly changing elements in any spatio-temperal segment, e.g., landforms as contrasted with the men traversing them. If by structure or morphology is meant model, the contrast to concrete process is obvious and trivial; it is merely that between a sign and its meaning, between the map and the territory, and no empirical science using a model, a map, or any other sign-system ignores the empirical things these signify. The things geographers call structural may be the things we customarily map, but anything can be mapped.

Some methodological implications. De-

prived of the glamor of metaphysics and the false imagery of Newtonian atoms-in-the-Void, space becomes a most unprepossessing word. It labels certain purely mathematical notions, certain operations of measurement, and certain aspects of or relations among processes. Mathematical spaces and distance-measurements are the property of all science. If, therefore, the word space is to designate any peculiarly geographic concepts, these must be concepts of process. But can any such qualify as our basic organizing concept?

Three spatial concepts seem particularly important for geography. One is a straightforward concept of relative scale or magnitude of process, impeccably relativistic if rather Schellingian in flavor. Following Hartshorne, we can state that the minimal geographic problem has as its domain, its universe of discourse, an integration consisting of two objects, unit-processes, which are causally (processually) connected. *(32)* Each object by itself is likely to be the domain of another science. Therefore, the scale or magnitude of a geographic problem is *necessarily* greater than that of any problem concerning the objects themselves. The same applies with greater force for more complex integrations, up to the limiting case of geomer, compage, or total integration. Many of our spatial concepts seem merely to designate either the integration itself or its peculiarly geographic scale, thus: area (an integration); spatial setting (an integration excluding only the object-of-reference); spatial variable (a causal factor operating at the scale of the integration, not the included object); spatial circulation (movement of an object against the reference-frame of the including integration); spatial association (association among the objects in an integration, not among the parts of a single object); and the like. Since scale is implied in the very concept of integration, this idea of space cannot be our basic organizing concept; and, if geography is a science of space in this sense, it is a science of certain types of space-time integrations.

A second concept of space, closely allied to the first, designates various notions of between-ness, of physically intervening variables. The problem of explaining or predicting a spatial location minimally involves: the object of reference; all other objects influencing the object of reference and forming, with it, an integration (as in a nodal region); and certain real processes intervening between and connecting the object of reference with others in the integration. These last might be called the ground against which the objects—the more clearly discriminated unit-processes—play; they commonly appear on maps or location diagrams as naked lines connecting the objects, or they simply disappear into the blank spaces. Space as intervening ground-processes (e.g., those intervening between farm and market) is obviously an important concept for, among other things, it introduces the friction of distance, but it is not really a basic organizing concept for anyone but location theorists. However, neglect of this concept has had at least two unfortunate effects. First, it has generated much spatial mysticism, since the space between objects must be filled either with ground-processes, or with strange Forces, Influences, or with the Void. Second, it has led, in the writer's opinion, to needless disputation over the place of simple, single-element, distribution studies in geography. Hettner maintained that "the Where of something is a property of the object," not of its surroundings, and that a simple distribution is therefore a problem for the specialist in that type of object. *(33)* But space is a property (relation) of the integration as a whole, i.e., distributed objects, and ground, and other kinds of objects together. Thus, explaining or predicting a simple distribution involves analysis not only of relations among the distributed objects, but also, as Ackerman has noted, relations with their environment (Ackerman's element of space), and is eminently geographic. *(34)* Of course, wherever interaction among the distributed objects themselves is the only important locational factor, other kinds of objects having no significance and the ground generating no severe friction, as is the case with most non-material culture elements and some population distributions, the problem is not geographic, because only the one kind of object is directly involved.

The third critical spatial concept is the cross-sectional relation of simultaneity. Simultaneity among objects *within* an integration is built into the definition of integration, and requires no comment; it is about as surprising as the fact that a horse has four simultaneous legs, except for one caution: since an integration is spatio-temporal,

only the structural elements need be simultaneous. But simultaneity *between* integrations involves some special issues. Since Kant, geographers have been accustomed to thinking of areal comparisons, comparisons of place with place, and analysis of areal differences and similarities, as essentially limited to simultaneously occurring events, to space in the sense of cross-sections through time. But if geography is to become a generalizing science (and on geographer, to the writer's knowledge, has ever forbidden us this goal), it must take its comparisons where it finds them, comparing here–now with there–then as well as there–now. If one wishes to classify the matter of farming systems, cities, or floods, and to discover the laws that generate and differentiate each class, one accomplishes less than half the task by investigating only those examples co-existing at a given time. The former simultaneity concept is merely an implicate of the Hartshornian concept of integration (if two objects affect each other, they *must* be simultaneous); the latter, that of cross-sectional comparisons, is painfully confining. Therefore, we are still without a spatial notion which qualifies as a suitable basic organizing concept. The writer can think of no other candidates.

* * *

(*) Part of this paper was read at the 1957 annual meeting, Association of American Geographers.

(1) Whittlesey, D., "The Regional Concept and the Regional Method," in James, P. and Jones, C.F., eds., *American Geography: Inventory and Prospect*, Syracuse, 1957, p. 28.

(2) For discussions of Greek ideas about space, see Jammer, Max, *Concepts of Space: A History of Theories of Space in Physics*, Cambridge, Mass., 1954; Burnet, John, *Early Greek Philosophy*, 4th ed., New York, 1930; Russell, Bertrand, *A History of Western Philosophy*, New York, 1945.

(3) Newton, Isaac, *Principia*. For discussions of Newtonian space, see Jammer, *op. cit.*; Burtt, E.A., *Metaphysical Foundations of Modern Science*, 2nd ed., New York, 1932; Reichenbach, Hans, *The Philosophy of Space and Time*, transl., New York, 1958, and *The Rise of Scientific Philosophy*, Berkeley, 1951.

(4) Russell, *op. cit.*, p. 40.

(5) Melissus, quoted in Burnet, *op. cit.*, p. 323.

(6) Jammer, *op. cit.*, p. 7.

(7) Reichenbach, *op. cit.*, *The Philosophy . . .*, p. 20.

(8) See Aristotle's *Physics*, Book 4.

(9) I have simplified Kant's views without, I believe, misrepresenting them. For discussions of Kantian space, see Kant's *Critique of Pure Reason* and *Metaphysical Foundations of Natural Science*; Russell, *op. cit.*; Reichenbach, *op. cit.*, *The Philosophy . . .*; Garnett, G.B., *The Kantian Philosophy of Space*, New York, 1939.

(10) See Watson, John, *Schelling's Transcendental Idealism*, Chicago, 1882; Gode, A., *Natural Science in German Romanticism*, New York, 1941; Mead, G.H., *Movements of Thought in the Nineteenth Century*, Chicago, 1936.

(11) Whitehead, A.N., *Science and the Modern World*, New York, 1925, pp. 74, 93-124, 212. See also Russell, Bertrand, *The Analysis of Matter*, London, 1927, p. 14; Dingle, H., "The Scientific Outlook in 1851 and 1951," *Brit. J. Phil. Sci.*, Vol. 2, 1951, pp. 85-104.

(12) Poincare, Henri, *Science and Method*, transl., New York, 1921, p. 95.

(13) See Whitehead, A.N., *The Principle of Natural Knowledge*, Cambridge, 1919, Secs. 2 and 11; Russell, Bertrand, *Philosophy*, New York, 1927, Ch. 10.

(14) Hartshorne, Richard, *The Nature of Geography*, 2nd ed., Lancaster, Pa., 1946, p. 149.

(15) Ritter, Carl, *Erdkunde*, 1817, quoted in Hartshorne, *op. cit.*, p. 57; Humboldt, A.v., *Kosmos*, Vol. 1, Stuttgart, 1845, p. 59.

(16) Michotte, Paul, "L'Orientation Nouvelle en Geographie," *Bull. Soc. Roy. Belge Geog.*, Vol. 45, 1921, pp. 15-17.

(17) Marthe, F., "Begriff, Ziel, und Methode der Geographie," *Zeit. Gesell. Erdkunde Berlin*, Vol. 12, 1877, p. 433; De Geer, Sten, "On the Definition, Method and Classification of Geography," *Geografiska Annaler*, Vol. 5, 1923, pp. 3-7.

(18) Wust, W., "Raum und Welt-Anschauung," in Haushofer, K., ed., *Raumuberwindende Machte*, Leipzig, 1934, p. 161; Grabowsky, A., *Raum als Schicksal*, Berlin, 1933.

(19) See Kraft, Viktor, *The Vienna Circle*, transl., New York, 1953, p. 33.

(20) See Ayer, A.J., *Language, Truth, and Logic*, 2nd ed., London, 1946, p. 42; Carnap, R., *The Logical Syntax of Language*, London, 1937, Secs. 72-8.

(21) See Whitehead, A.N., *The Concept of Nature*, Cambridge, 1920; Poincare, *op. cit.*, p. 95; Hartshorne, Richard, *Perspective on The Nature of Geography*, Chicago, 1959, p. 82.

(22) Marthe, *op. cit.*, pp. 422-67; De Geer, *op. cit.*, pp. 1-37; Grano, J.G., "Reine Geographie," *Acta Geographica*, Vol. 2, 1929, pp. 1-34, 174ff, and "Geographische Ganzheiten," *Petermann's Mitt.*, Vol. 81, 1935, p. 297; Losch, August, *The Economics of Location*, transl., New Haven, 1954, pp. 3, 508; Huntington, Ellsworth and Cushing, S.W., *Principles of Human Geography*, 3rd ed., New York, 1924, Ch. 1 (location, along with landforms, etc., is a factor of the environment); Warntz, William, *Toward a Geography of Price*, Philadelphia, 1959, pp. 13, 26, 41, 98, 101-4, and (with Stewart, J.Q.) "Macrogeography and Social Science," *Geog. Rev.*, Vol. 48, 1958, pp. 168, 175-7, 180-1.

(23) Lukermann, F., "Geography: De Facto or De Jure," 23 pp., mimeo, 1960 (?). This excellent paper analyzes the work of Warntz, Schaefer, and a few other recent writers in terms of their ideas about absolute space, holism, and the like.

(24) Hartshorne, *op. cit.*, *Perspective . . .*, Ch. 8.

(25) Kant, *op. cit.*, *Metaphysical Foundations . . .*, p. 136, in Bax, E.B., transl., London, 1891.

(26) Kant, *Physische Geographie*, Rink ed., quoted in Schaefer, F.K., "Exceptionalism in Geography," *Annals Assoc. Amer. Geog.*, Vol. 43, 1953, p. 232.

(27) Ratzel, Friedrich, *Anthropo-Geographie*, Vol. 1, Stuttgart, 1882, p. 10.

(28) See Steiner, Rudolf, *Goethe's Conception of the World*, transl., London, 1928; Windelband, W., "Logic," in Jones, Henry, ed., *Encyclopedia of the Philosophical Sciences*, Vol. 1, London, 1913, pp. 39-41, 43-46, 56-59.

(29) Cramer, W., reported in Wagner, Hermann, "Bericht uber die Methodik der Erdkunde," *Geog. Jahrb.*, Vol. 9, 1882, pp. 678-9; Vol. 12, 1888, p. 422; Krebs, Norbert, "Nature- und Kulturlandschaft," *Zeit. Gesell. Erdkunde Berlin*, 1923, p. 83.; Sauer, Carl, "The Morphology of Landscape," *Univ. Calif. Publ. Geog.*, Vol. 2, 1925, pp. 19-53.

(30) Schaefer, *op. cit.*, pp. 227-8, 231, 242-9.

(31) Bertalanffy, Ludwig v., *Problems of Life*, London, 1952, p. 134.

(32) Hartshorne, *op. cit.*, *Perspective . . .*, Ch. 9. I assume here that the term object is a reductive level below integration (see Oppenheim, P. and Putnam, H., "Unity of Science as a Working Hypothesis," *Minn. Studies Phil. Sci.*, Vol. 2, 1958, pp. 3-36) and that both are systems as defined by L.v. Bertalanffy in "Outline of General System Theory," *Brit. J. Phil. Sci.*, Vol. 1, 1950-51, pp. 134-65.

(33) Hettner, Alfred, "Das Wesen und die Methoden der Geographie," *Geog. Zeit.*, Vol. 11, 1905, p. 557.

(34) Ackerman, Edward, "Geographic Training, Wartime Research, and Immediate Professional Objectives," *Annals Assoc. Amer. Geog.*, Vol. 35, 1945, p. 134.

TOWARD A MORE LITERARY GEOGRAPHY

Barry N. Floyd
Dartmouth College

> I cannot but wonder sometimes if we geographers do not weed out too completely the flowers of art in producing the bread grains of science.
>
> Stephen Jones

THIS ESSAY treats of the role of good writing in the presentation of geography; it suggests ways in which we, as geographers, may elevate our writing abilities and improve both the quality and the appeal of geographic literature. At a time when the quantitative geographer, with his statistical techniques, is exploring new dimensions in our field, it is perhaps salutary to pause and review certain time-honored methods of geographic exposition.

The term literature implies the written

word, and words are the verbal symbols of things – in our case, things geographic. They are, in effect, our thoughts expressed in language, and only through the skillful selection and arrangement of words may we express our concepts clearly, accurately, and attractively. It is this verbal skill which is implicit in the word literary.

In his inaugural address as Professor of Geography at Oxford University in 1954, E.W. Gilbert chose to emphasize the need for a literary improvement in geographic exposition. His emphasis was twofold. He urged stricter attention to English grammar, i.e., the sheer structural techniques of scholarly writing, but he also stressed the need for that delicate and individual thing which may be called the author's sense of style – his literary sensibility.

Anyone familiar with geographic literature recognizes this dual need for improved scholarship. Geographic articles, though they appear in respected professional journals, are not infrequently lacking in literary qualities. At times, one feels that the artisans of geography are increasing at the expense of the artists.

Perhaps the common dependence of the academic hierarchy upon quantity of research published, rather than upon quality, is responsible for the production of unpolished writing. But one feels that the trouble lies deeper than this. Many of today's publishing geographers are competent enough workmen and well thought of in the profession. They are trained researchers and the pupils of eminent professors. Yet, after a long academic preparation for their life's work, it is surprising how few of them have mastered the writing of correct and aesthetically attractive English. To be sure, we have all been obliged to read good literature during our training, but many of us seem to have remained quite insensitive to it. We are tone-deaf to the use of words.

In advocating a more literary geography, we may observe at the outset that the objectives and conceptual framework of geographic research are generally agreed upon. The pursuit of geography commonly involves three stages of study. The first stage is observation and factual enquiry in the field, according to accepted scientific methods evolved by geographers. The second stage is that of interpretation. Having accumulated the facts, the geographer then attempts to interpret and explain the significance of variations in the observed phenomena – to unravel their causes and weigh their consequences. He examines, if one may still use the term, the areal differentiation of that portion of the earth shell which has attracted his scholarly attention.

The third phase in geographic research is presentation: the narration or exposition which sets forth the results of the field survey and subsequent interpretation. Refining the methodological concepts of the first and second stages has received much attention by geographers. But neglect of the third stage threatens to obscure the worth of geographic investigation through inadequate presentation of the results. For beyond content lies form, a vital ordering and distribution of succinct words, correct grammar, and an engaging style. As Sir Arthur Quiller-Couch has written: "The style is the man, and where a man's treasure is, there is his heart and his brain, and his writing will be also." *(1)*

Following E.W. Gilbert's example, we may analyze literary form along twofold lines. First, we may give some attention to grammar, or the mechanics of composition, and second to the equally significant matter of literary style. Certainly both aspects are of the utmost importance if geographic writing is to impress and inspire its readers, and ultimately to endure. The premise is assumed that geographic writing is intended for the thoughtful citizen as well as for the specialist.

Grammar. One is tempted to dismiss the treatment of grammar by bibliographic reference to a reliable manual on English composition. Yet, so frequent are errors of syntax which appear in geographic writing that a few observations are necessary.

The basic fault of much present-day writing is to say what one has to say in as complicated a way as possible; instead of being simple, terse, and direct, the diction is stilted and long-winded. *(2)* Sentences are stretched, filled with subordinate clauses, and either improperly peppered with punctuation marks or completely innocent of them.

It is essential for us as writers to master a discreet use of periods, semi-colons, and the oft-abused comma. A piece of writing should have an adequate introduction and should be divided into chapters and paragraphs of reasonable length, a reasonable length being that distance in print which

will keep the reader's attention. To woo the reader is vital in good writing.

Paragraphs should be introduced by what grammarians call the topic sentence, which has the lubricating function of carrying the reader from what has been said to what is about to be said. But one should not introduce every paragraph with a formal topic sentence. Prose beaten out according to any rigid mechanical law will be dull and monotonous. *(3)* A writer can afford to take certain liberties with the rules for correct writing providing he bears their function in mind.

In some respects, the rules of grammar and syntax are comparable to those of harmony and counterpoint in music. Yet, one can no more write good English than he can compose merely by observing the rules. *(4)* Thus, one should aim to write with a sense of proportion, continuity, and a pleasing variety of sentence structure, which brings us to the matter of literary style.

Literary style. Style has been described as a thinking out in language. To Quiller-Couch, style resembles good manners; it comes of endeavoring to understand others, of thinking of them rather than yourself. To achieve style one must, according to Sir Ernest Gowers, "cultivate unremittingly that clarity of thought and simplicity of expression which have always been preached by those who have studied the art of writing." *(5)* Only clear ideas can be accurately stated in print and expressed in precise word symbols. Simplicity and clarity of expression are the keys to sound writing.

Yet there is a tendency for scholars in many fields to try and justify their disciplines by an appeal to obscure words and a complex terminology. According to Jacques Barzun, this desire to appear scholarly has been responsible for a debasement of language beyond all bounds of forgiveness and has resulted in a "ghoulish Desperanto."

Sometimes, it is true, the use of a distinct vocabulary is justified for, as Preston James has pointed out, vague words may be a serious handicap to sharp thinking. *(6)* If a specialist develops an esoteric concept for which the existing language appears unable to provide an exact symbol, then the need for a new technical term may be a real one. But he should not pounce upon a new word until he is quite satisfied that no word better, or as good, exists in the language. Sometimes the lack lies not in the language but in the vocabulary of the innovator. *(7)* If used only to impress, a special terminology is deplorable.

Teachers of English label this pseudo-scientific style of writing, jargon; it is known in Washington as the art of gobbledeygook and in London as the Civil Service style. Essentially, jargon is a literary style characterized by a needlessly specialized vocabulary and a love of trite phrases which either mean nothing or are long-winded ways of saying something that could be said much better in a few syllables. *(8)* Another writer describes jargon as simply a "cat chasing its own tail" verbosity. *(9)*

To write jargon is to be perpetually shuffling around in the fog of abstract terms. "So long as you prefer abstract words, which express other men's summarized concepts of things, you will remain, at best, writers at second-hand. If your language be jargon, your intellect, if not your whole character, will almost certainly correspond. *(10)*

An illustration of jargon will help to emphasize its obnoxious nature: *Bible:* "Render to Caesar the things that are Caesar's." *Jargon:* "In the case of Caesar it might well be considered appropriate from a moral and ethical point of view to render to that potentate all of those goods and materials of whatever character or quality which can be shown to have had their original source in any portion of the domain of the latter." *(11)*

S.T. Williamson is extremely critical of social scientists who practice jargon. He claims that: "They are members of a caste; they are so used to taking in each other's literary washing that it has become a habit for them to clothe their thoughts in the same smothering verbal garments. . . . Such pedantic Choctaw may be all right as a sort of code language or shorthand of social science to circulate among initiates, but its perpetrators have no right to impose it on others. The tragedy is that its users appear to be under the impression that it is good English usage." *(12)*

Much of this criticism strikes home to the geographer, for one sees jargon making inroads into our field. The trouble in geography is not simply a matter of terminology. As Sauer has observed, the "facts of area" have been under popular observation to such an extent that a new, distinctly geographic terminology is not really necessary.

(13) Furthermore, many of the special words which geographers do use have been chosen with some care in order to sharpen geographic concepts; it is up to us to master the precise meanings of these special terms.

The real trouble in geography would seem to be that many of us take insufficient care with words *outside* our special vocabulary. The English language contains an abundance of simple, wholesome words, and by writing with attention to the finer shades of meaning the most subtle concepts may be expressed. *(14)* One cannot agree then with L. Bryson who claims that each discipline should have a distinct vocabulary of its own, since ordinary language is made up of words with vague, complex, multiple, and oblique meanings. *(15)* It is not the English language which is at fault but the inattention of many scholars to the verbal wealth of their own tongue.

One can make the parenthetical remark here that we might well spend time mastering our own language before attempting to gain a mere reading knowledge of one or two foreign languages. The fact remains that too few of us have made an effort to master ordinary English. This inattention to lay words has long been excused as a facet of the academic mind. Perhaps it should be called what it really is, "intellectual laziness and grubbymindedness."*(16)*

Compatibility of science and literature. We come at this point to a matter of deeper concern. There are plodding research workers in all fields who would persuade us that good writing is "something extrinsic to the subject, a kind of ornamentation laid on to tickle the taste, a study for the dilettante, but beneath the notice of their stern and masculine minds." *(17)* These men look down on, not up to, clear simple English. They scorn it as popular or journalistic. They explain their failure to put more mental sweat into their writing on the grounds that "the social scientists who want to be scientific believe that we can have scientific description of human behavior and trustworthy predictions in the scientific science only as we build adequate taxonomic systems for observable phenomena and symbolic systems for the manipulation of ideal and abstract entities." *(18)* Standing on ground largely of his own choosing, L. Bryson argues against judging social science writing by literary standards. He and others of his faith not merely disdain literary style but condemn it as pernicious, as leading to subtle perversion of the truth. *(19)* They claim that scientific objectivity and literary skills cannot be mixed and that dependable knowledge should not be confused with literary expressiveness.

Richard Hartshorne tends to support Bryson in applying this argument to geography; he suggests that the subjectiveness of literary description is something rather different from the objective description which geographers must try to provide. He feels that, however effective literary writing may be in presenting the character of an area, it does not satisfy scientific standards of knowledge. "Only trained geographers can provide an objective, quantitatively measured, scientifically interpretative, and dependable presentation of an area." *(20)*

This paper is not intended as an essay in semantics or philosophy; but some of the concepts contained in Bryson's and Hartshorne's arguments should be challenged. What *is* scientifically objective, dependable knowledge? Can it ever be achieved in reality? Are there any pure facts untainted by subjective judgment or unwarped by the very act of human perception?

These are questions to puzzle the professional philosopher, but others are more relevant to geographers. If geography has as its goal "an analysis of the *meaning* of likenesses and differences" on the earth's surface *(21)*, can scientific objectivity ever really be achieved? In other words, are not geographers more interested in the *meaning* or *evaluation* of geographic features rather than their mere existence? If this is so, then one submits that complete objectivity is well nigh impossible.

Two geographers entering an area to study its geographical features are certain to receive differing impressions. They are likely to develop differing interpretations. Being human, they cannot arrive at identical conclusions; it would, indeed, be very deterministic of us to expect it. Thus, there can never be an exact evaluation of geographic facts once and for all; an element of subjectivity is unavoidable. And if some measure of subjectivity has to appear in geographic research, why should not literary skills be utilized in geographic exposition? Why should not our two geographers present their separate evaluations of the area they are studying? Why should not each in his own

literary way present the truth as he sees it? Surely, in this sense, the terms scientific method and subjective judgment are not incompatible?

The point to be made is that geography actually relies upon both science and literary art. It depends upon science in that it must perform every possible office of scientific research and objective criticism. It depends upon literary art in that, if it is to prove a vital branch of human knowledge, it must have literary attractions of form and style and spirit.

In sum, it is possible to be scientific and exact and also write with high literary charm. (22) Literary art is not simply a valuable ally of geography but it is indispensable to its highest achievements. It is not necessary to be dull in order to prove that one can write with geographic accuracy.

But let it be clearly understood that high literary merit is not to be confused with mere entertainment. Literary form is not just a *toilette* of skin-deep quality. Lord Macaulay in his essay on Horace Walpole wrote: "He sets out an entertainment worthy of a Roman epicure, an entertainment consisting of nothing but delicacies, the brains of singing birds, the roe of mullets, the sunny halves of peaches." (23) Literary excellence implies something deeper than this. It is grace of mind added to ability of mind; intellectual finesse upon intellectual fact.

• • •

(1) Quiller-Couch, A., *On the Art of Writing*, New York, 1916, p. 126.
(2) Gowers, E.A., *Plain Words: A Guide to the Use of English*, London, 1948, p. 31.
(3) Kent, S., *Writing History*, New York, 1941, pp. 61-2.
(4) Gowers, *op. cit.*, p. 2.
(5) Gowers, *op. cit.*, p. 94.
(6) James, Preston E., "The Terminology of Regional Description," *Annals of the Association of American Geographers*, Vol. 24, 1934, p. 78.
(7) Allbutt, Sir T. Clifford, *Notes on the Composition of Scientific Papers*, London, 1923, p. 42.
(8) Boulton, Marjorie, *The Anatomy of Prose*, London, 1954, p. 81.
(9) Williamson, Samuel T., "How to Write Like a Social Scientist," *Saturday Review of Literature*, Vol. 20, No. 40, October 4, 1947, p. 17.
(10) Quiller-Couch, *op. cit.*, p. 126.
(11) Merrill, Paul W., "The Principles of Poor Writing," *Science Monthly*, Vol. 64, January, 1947, p. 73.
(12) Williamson, *op. cit.*, p. 27.
(13) Sauer, Carl, *The Morphology of Landscape*, University of California, Publications in Geography, Vol. 2, No. 2, October, 1925, p. 34.
(14) James, *op. cit.*, p. 78.
(15) Bryson, Lyman, "Writers: Enemies of Social Science," *Saturday Review of Literature*, Vol. 28, No. 41, October 13, 1945, p. 10.
(16) Williamson, *op. cit.*, p. 27.
(17) Quiller-Couch, *op. cit.*, p. 38.
(18) Bryson, *op. cit.*, p. 10.
(19) Nevins, Allan, *The Gateway to History*, Boston, 1938, p. 44.
(20) Hartshorne, Richard, *The Nature of Geography: A Critical Survey of Current Thought in the Light of the Past*, Lancaster, 1939, p. 133.
(21) James, Preston E. and Jones, Clarence F., eds., *American Geography, Inventory and Prospect*, Syracuse, 1954, p. 7.
(22) Nevins, *op. cit.*, p. 350.
(23) Quoted by Nevins, *op. cit.*, p. 361.

CLIMATOLOGY AND GEOGRAPHERS

Llewelyn Williams

Quartermaster Research and Engineering Command, Natick, Mass.

THE CONCEPT of climate as one of the principal controls in the formation and content of the natural landscape is an axiom among geographers. Yet, with respect to climate as an active force, the geographer is in a dilemma. On the one hand, the science of the atmosphere has progressed to the point where the geographer is no longer considered a significant contributor. Furthermore, methods of the meteorologist and climatologist are not necessarily attuned to the needs of the geographer. On the other

hand, the geographer cannot completely disassociate himself from this part of the physical environment, for he has a vital interest in the effect of this environmental factor upon man and man's activities. S.B. Jones *(1)* discusses this dilemma in his article, "What Does Geography Need from Climatology?", which appeared 11 years ago in *The Professional Geographer*. The significance of this contribution lies not only in the question posed, but also in the background developed by an outstanding geographer in framing the question. Whether statements made are deliberate or not, they clearly reveal the shortcomings of most geographers with regard to climatology. Certainly, responses elicited by the article only prove that what geography or geographers need from climatology, or what climatology or climatologists need from geography, remains a moot question. There is little unanimity among the replies.

Jones' article clarifies but does not resolve the present dilemma of most geographers with respect to climatology. The principal question is whether geographers might best be served by the traditional approach to climatology, i.e., as a subscience concerned with the area of overlap between geography and meteorology, or by elevation of that field to the status of an independent science among related physical sciences. The past record of geographers with regard to this question is not one to inspire confidence. It appears timely for geographers to make a survey, and either plan for the future or candidly affirm that their interests would best be served by the development of climatology as an independent field.

"Climatology, a subdivision of physical geography . . ." (2) In his report on the status and trends of geography within the United States during the years 1952 through 1956, C.F. Jones *(3)* points out that less than four per cent of the geographers specified climatology as their first field of specialization and even a smaller percentage as their second field of interest. Jones considers this in part responsible for the relatively few (about eight per cent of the total) dissertations written on climatology by geographers during the five-year interval. He also notes a lack of analytical character to most of the studies. A quick analysis of data in the AAG *Handbook-Directory* for 1961 again shows that less than four per cent of the geographers consider climatology as their first field of specialization and, again, a smaller percentage as their second field of interest. Actually, less than half of those geographers listing climatology as either first or second field of interest holds the rank of assistant professor or higher.

The lack of interest in, and of educational facilities in, the field of climatology are emphasized by Court *(4)*, Landsberg *(5)*, Thornthwaite and Leighly *(6)*, D.H. Miller *(7)*, and others. Court spells out the situation rather clearly: "today's professional climatologists are largely self-trained. Some have doctorates in geography, in geophysics, in meteorology, or in oceanography — but they learned their climatology the hard way, by working at it, not by formal study." Landsberg brings out the seriousness of this situation during the war. In his terms, a climatologoist is "an expert in the science of climatology which treats of climate and who investigates the phenomena of climate and their causes." As he points out, this country had few experts, but rather a number of dilettantes who, through their efforts at compiling averages, stamped climatology as a descriptive science. He believes that, since the war, there exists the tendency to revert to such methods.

A candid appraisal of the geographer's role in "climatology, a subdivision of physical geography . . ." leads only to the most pessimistic outlook with respect to climatology as part of the broader field of geography. It would appear that, to most geographers, climatology is either outside the scope of geography or an unnecessary appendage to it.

Need for climatological research. Somewhere along the way, climate and climatology entered a cul-de-sac and science and progress passed by. A century or more ago, when weather data were few and scattered, meteorology was mainly climatology with an emphasis upon daily and seasonal march of weather. As networks began to obtain practically instantaneous readings, meteorology became concerned principally with the immediate, whereas climatology became more concerned with orderly organization of data and was in due time mired in the increasing avalanche of statistics. The chasm between climatology and meteorology is now so deep that it is reflected in the status of researchers in the respective fields. Therefore, just for reasons of status, research is labeled meteorological whenever possible. Climatology, as

a science, is not actively being developed within the field of meteorology nor within the field of geography.

As in any discipline, there exists the cultural and practical need for research in climatology for its own sake. It is not only the fact that something happened; why and how it happened is frequently of greater significance. Climatological research is needed, as Landsberg *(5)* emphasizes, if only for the benefit of the neighboring sciences – meteorology, biology, ecology, epidemiology, as well as for public health, public housing, flood control, soil erosion, marketing, and air-traffic control. Even the overwhelming array of figures masquerading as climatological data needs to be reviewed. As Thornthwaite and Leighly *(6)* point out, values arrived at in the standard instrument shelter under standard exposure conditions are only an abstraction of the climate, because the regional climate is a composite of innumerable local climates. Thornthwaite *(8)* introduces the very apt term of topoclimatology to cover this concept. Precipitation data are not measurements but instead a sampling to Landsberg *(9)* when the area of the rain gage is considered in relation to area represented by the gage; even identical rain gages standing side by side often do not agree closer than 10 per cent in day-to-day values, and they may show a fairly large percentage difference even in annual values. To carry the discussion one step further, Wolfe, Wareham, and Scofield *(10)* report finding greater climatological differences within a 150-acre valley studied in central Ohio than those reported in published records of the whole network of 88 stations covering the 43,000 square miles of Ohio. Also, Daubenmire *(11)*, in testing the Koeppen climatic classification system of 1936, Thornthwaite's system of 1931 and of 1948, and Swain's system of 1938, found little homogeneity to the vegetation in eastern Washington and northern Idaho within any of the climatic types, or of climatic types within any of the vegetation belts. Neither was he particularly successful in the application of data from the 44 regular cooperative Weather Bureau stations in the area to the differentiation of the vegetation belts. Ecologists on the whole have found that standard reported climatological data have only the broadest relation to their own particular problems.

It does appear, then, that in this area of neglect by both geographers and meteorologists, there is a need for research in taking the most basic measurements and in understanding the simplest relationships.

Climatology as a science. There is the question as to whether climatology could stand alone, in terms of interest and support, with a scope limited essentially to the local climate. To develop to the point of becoming a recognized science, climatology must have a core that is not only definitive, but must be distinct from related sciences. In addition, in the areas of overlap with the related sciences, the role of climatology must remain definable and distinct. To define climatology in such terms is possible.

Fundamentally, the fields of climatology and meteorology should have parallel structures, for both are concerned with the atmosphere and atmospheric processes. The major difference between the two fields should be only that of scale. Essentially, meteorology emphasizes the how and why of the immediate; how and why the immediate of today differs from the immediate of yesterday, and how and why the immediate of tomorrow will differ from that of today. Expand the time and areal scale by a magnitude or two, and the related problems become the core of climatology; that is, how and why a series of immediates combine to form longer period atmospheric perturbations on a global scale. Meteorology emphasizes uniformity of exposure for its instruments, in order to obtain comparable values principally as representative of so-called free air weather. In contrast, climatology should emphasize representative measurements of the variations in weather occurring over the landscape because of the influence of terrain, vegetation, or both; and should indicate how these variations combine to become climate under the influence of longer period perturbations.

If thus constituted, climatology would fill an obvious void in the prevailing programs in geophysical research; and it would be more closely associated with, and applicable to, the fields of biology, ecology, geology, public health, flood control, soil erosion, and even perhaps air-traffic control than is the present field of meteorology.

Need for a climatological institute. Eighteen years ago Thornthwaite and Leighly *(6)* proposed the establishment of an institute of climatic research. The reasons and need for such an institute are as valid today as they were then, and perhaps even more so.

There is still the lack of any agency in a position to help scientists faced with climatic problems; there is as yet no program of organized courses leading to an advanced degree in climatology; there continues to be available for research only those nonrepresentative data published in the climatological records; there is no technical help to aid in obtaining suitable measurements; the literature still consists largely of publications of a descriptive nature written by geographers; and the need continues to develop qualified climatologists. However, the organization and scope of the institute proposed by Thornthwaite and Leighly has one shortcoming. Their outlook, as is that of S.B. Jones *(1)*, is restricted to applied climatology. Such an institute, if it is to stand and continue, must have as its core the investigation of longer-period perturbations in the atmospheric circulation with all their ramifications and, with this, the measurement of variations in regional and local climates associated with such perturbations. This should obtain, even though the principal effort of the institute may well be devoted to areas of overlap with the neighboring sciences of geography, geology, biology, medicine, and others. It would be advantageous, as Thornthwaite and Leighly point out, for such an institute to be affiliated with a first-rate university. However, for that university to also include an agricultural college and experiment station is no longer of the same relative significance. Advantageous, too, would be associations with agencies of the Federal and State governments dealing with forestry, agriculture, public health, regional planning, and other areas.

There are many problems in the field of climatology requiring intensive investigation, including what many would consider the ultimate—climate control. But control, without knowledge of mechanics and effects, is a two-edged sword. Control as a goal might well be used as a succinct expression for the theoretical aspirations of the institute.

Measurement of climate would be one basic goal of the institute. Certainly, much of the statistical information now collected and compiled is not only inadequate but frequently misleading. A review of the data is indicated, as is also an evaluation of stations in terms of representativeness with respect to local terrain and vegetation. Brooks *(12)* gives some representative densities for reporting stations, depending on the element being measured and the nature of the terrain; but there is not only the problem of terrain, but also that of vegetation. In other words, where are instruments to be placed in relation to grass, crops, and trees? Profiling may be necessary with respect to vegetation, as well as to terrain. Also, what about measurements with respect to soils and exposed crags? How can the concept of climate as one of the principal controls in the formation and content of the natural landscape become developed without adequate and representative measurements? Then there are the associated problems of what to measure, how to measure, and how frequently to measure in order to avoid being again mired in an avalanche of data. It appears necessary to develop automation in gathering representative data, once instrumentation is completed; and to develop interest in universities, experiment stations, and other places as subsidiary collecting points for data. Automation should be developed to permit storage, recall, and analysis of data. It would be advantageous if the institute would be a depository for representative data on a global basis.

Another important task for the institute would be development of climatologists. Most instruction should be at the graduate level, with the institute's staff being responsible for the cohesiveness of the curriculum. Courses in neighboring sciences, as well as in physics, mathematics, and engineering, should be available. Here, close affiliation with a university is of utmost importance for quality and breadth of the courses offered. Visitors would also be a source of instruction, whether they came from the academic ranks or from agencies where climate is an important factor in the work.

Need for research in the field of climatology is axiomatic. An institute would serve as a germ or catalyst for this research, and would produce benefits far beyond its own contributions. It does seem amazing that such an institute is not in existence and openly supported; even though Thornthwaite's Laboratory of Climatology has been successful for a period of years, it appears to cover only a few of the concepts herein proposed. Establishment of a climatological institute should be within the scope of private foundations, and should warrant continuing support from many agencies,

both private and governmental, that are interested in fields where climatology can make significant contributions. But, without question, the largest single agency that would benefit from development of climatology as a science, and from the initiation of a series of systematic investigations of both a theoretical and applied nature, is the Department of Defense. The medium of operation for much of the defense effort is the natural environment, and climate is an important element in that environment. A better understanding of climate, and of the risks involved in operating in it, could be most beneficial to the Army, Air Force, and Navy. And even the most remote prospects of climatic control should make the field of climatology of supreme concern to the Department of Defense and to the general public.

Conclusion. What does geography need from climatology? This still remains a moot question. However, it is evident that the geographer has not been able to resolve the question by ignoring the field of climatology. One must concur with S.B. Jones *(1)* that "it is no longer possible for all geographers, irrespective of their backgrounds, mathematical talents, and prospective careers, to master the whole of climatological theory." But "climatology, a subdivision of physical geography . . ." *(2)* does not have much substance when less than four per cent of the geographers list climatology as their major field of interest, and especially when less than half of these hold academic rank. A perpetuation of this situation can only lead to further deterioration in the quality of climatic research by geographers.

This paper has taken the position that climatology can be developed as a science among related physical sciences, and that this goal can best be accomplished through establishment of a climatological institute. It does not seem practical to expect the geographer to manifest a marked interest in climatology, nor is the meteorologist likely to change his sights from astrophysics to the apparently more prosaic field of climatology. It is obvious that the future of climatology rests only with climatologists. If geographers are at all interested, it appears timely that they plan for the future within the present framework; otherwise, it is time that climatologists explore the possibility of developing an organization devoted solely to the field of climatology.

• • •

(1) Jones, S.B., "What Does Geography Need from Climatology?", *The Professional Geographer*, Vol. II, No. 4, 1950, pp. 41-44.

(2) Trewartha, G., "A Reply to What One Geographer Wants from Climatology," *The Professional Geographer*, Vol. IX, No. 1, 1957, pp. 8-9.

(3) Jones, C.F., "Status and Trends of Geography in the United States, 1952-1957," *The Professional Geographer*, Vol. XI, No. 1, Part 2, 1959, 145 pp.

(4) Court, A., "Geography Must Train Climatologists," *The Professional Geographer*, Vol. II, No. 5, 1950, pp. 15-16.

(5) Landsberg, H.E., "Remarks on Teaching and Research in Climatology in the United States," *Bulletin of the American Meteorological Society*, Vol. 28, No. 9, 1947, pp. 419-421.
..... "Climatologists Respond," *The Professional Geographer*, Vol. II, No. 5, 1950, p. 17.

(6) Thornthwaite, C.W. and Leighly, J., "The Status and Prospects of Climatology," *The Scientific Monthly*, Vol. 57, 1943, pp. 457-465.

(7) Miller, D.H., "What Climatologists Need from Other Geographers," *The Professional Geographer*, Vol. IX, No. 4, 1957, pp. 8-10.

(8) Thornthwaite, C.W., "Topoclimatology," *Proceedings of the Toronto Meteorological Conference 1953*, Royal Meteorological Society, London, 1954, pp. 227-232.

(9) Landsberg, H.E., "Critique of Certain Climatological Procedures," *Bulletin of the American Meteorological Society*, Vol. 28, No. 4, 1947, pp. 187-191.

(10) Wolfe, J.N., Wareham, R.T., and Scofield, H.T., *Microclimates and Macroclimates of Neotoma, a Small Valley in Central Ohio*, Biological Survey Bulletin, No. 41, 1949, 267 pp.

(11) Daubenmire, R., "Climate as a Determinant of Vegetation Distribution in Eastern Washington and Northern Idaho," *Ecological Monographs*, Vol. 26, No. 2, 1956, pp. 131-154.

(12) Brooks, C.F., "Recommended Climatological Networks Based on the Representativeness of Climatic Stations for Different Elements," *Transactions, American Geophysical Union*, Vol. 28, No. 6, 1947, pp. 845-846.

MEASURING RESORT POPULATION INCREASES

Richard B. Erickson

Cap May County Planning Board

TOURISM is a growing phenomenon of American life. But, in spite of its economic importance and its dynamic influence on the movement and concentration of people, little in the way of factual information is available concerning the many aspects of the resort industry. The dearth of such information has come increasingly to the fore as more and more geographers seek to study this expanding activity.

As recently as this year, the Census Advisory Committee of the Association of American Geographers has recommended that a Census of Tourism and Recreation be added to the functions of the Census Bureau. *(1)* One of the specific suggestions of the Committee was the gathering of statistics that would reflect week-end residence and seasonal changes in residence. Although collection of data of this type on a nationwide basis may not be undertaken for some time, such information has been secured in at least one intensively developed resort area—Cape May County, New Jersey. *(2)*

Cape May County, at the southern tip of New Jersey (Fig. 1), has a history of tourism that can be traced back to the early years of the 19th century. Since that time, the number of resort communities in the County has grown from one to eleven, and the importance of tourism to the area's economy has increased tremendously. Although the County's economy depends heavily on the dollars spent by vacationers, no accurate information on the number of visitors has been available. This lack posed a serious problem in the development of a regional plan for Cape May County, since any planning proposals for such things as highways, utilities, parks, and open space must be made with an awareness of the size of the population they will serve. To obtain a more accurate picture of seasonal population increases, the staff of the Cape May County Planning Board in 1958 undertook a detailed census of summer population in two county resorts, Wildwood and Stone Harbor. Whereas this information was used to estimate vacation population in all County resorts, the present paper will deal only with the actual census of vacationers.

Methods. Before the census was carried out, a considerable amount of preliminary work had to be done. The timing of the census was of basic importance, for an unrealistic picture would result if the count were completed before the vacation season had reached a peak. A review of traffic counts on major highways leading to the

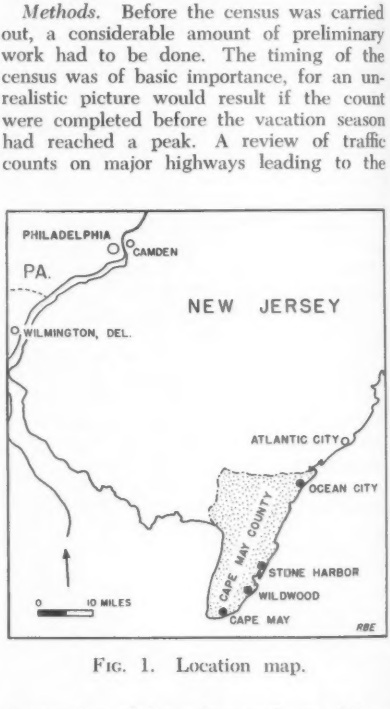


FIG. 1. Location map.

County showed that a four-week period from the middle of July to the middle of August would be best for conducting the census.

Following this, an estimate was made of the number of man-hours which would be needed to complete the enumeration. This estimate was based on the number of buildings in Wildwood and Stone Harbor, as shown on recent air photos, and on a test census of several pilot blocks in other municipalities. Besides providing an estimate of the time needed to carry out the census, the enumeration of pilot blocks tested the questions that would be asked, disclosed

the most satisfactory approach in asking the questions, and showed that blocks, rather than streets, would be the most efficient basis for designating enumeration areas.

Blocks were chosen as basic enumeration areas for several reasons. First, the block is a unit which is easily identified by number on a base map and readily recognized by enumerators. Second, the block is a unit commonly used to summarize information such as land use or housing conditions, which may be correlated with population. Third, it is far easier to map population distribution within the boundaries of a block than to map a linear distribution along a street. Fourth, it is simpler to calculate population density within a block than along a street front. If information on the distribution of population along a particular street is desired, this can be obtained easily by checking the addresses of line items recorded by the enumerators.

The questionnaire used in the final census was an 8½ x 11 inch mimeographed form containing five questions and with space for answers and any necessary comments. The form provided space for 22 separate interviews and for the enumerator's name, the date, the block number, and building address. The five questions finally chosen were: (a) How many year-round residents live in this building? (b) How many visitors were living in this building on last Saturday night? (c) How many visitors are living in this building today? (d) How many visitors could be accommodated in the building if all beds were occupied? (e) Is the owner of the building a year-round resident?

Good base maps were necessary for guiding enumerators in the field and for plotting results in the office. Recent maps at large scales were available for both Wildwood and Stone Harbor. All blocks on these were numbered, and several maps were cut into sections small enough to be carried by the enumerators.

A few days before the census, the enumerators were briefed on the purpose of the study, the methods by which it would be conducted, the manner in which they should carry out their work, and particular problems that they might encounter. This part of the program is especially important if enumerators are not familiar with this type of work.

In the area of administration, it seems necessary to have one person as a full-time supervisor. This person should check enumerators in the field and process returns daily, so that any questionable points can be clarified at once.

Public relations are also important. Vacationers are not always happy to be disturbed by a census taker; likewise, rooming house or hotel owners may be uncommunicative unless they clearly understand the purpose of the census. Because of this, it is essential that the public be well aware of the census. Articles in local newspapers explaining its purpose, followed by daily reminders over the local radio station, will increase public interest and smooth the way for enumerators. Cooperation from businessmen may be gained through the local Chamber of Commerce and/or hotel association. Finally, all enumerators should be impressed with the need for courtesy and should carry credentials.

Time is particularly a problem in a census designed to measure seasonal population in a resort area. The work must be completed within a relatively short period, but at the same time, some flexibility in the schedule is needed to allow for postponements or delays due to poor weather.

Working in a seaside resort also presents the problem of late sleepers and mass population movements to the beaches in the afternoon. Any enumerator who knocks on a door before 10:00 A.M. is likely to get a cool reception, and after 1:00 P.M. he is apt to find no one at home. In an area with a definite business-residential district, such as exists in Wildwood, it is possible to begin the day shortly after 9:00 A.M. by working in the hotel and motel district. Between 10:00 A.M. and 1:00 P.M., enumerators can work in the single-family residential area; and when they find that most residents have gone to the beach, the enumerators can move back into the business area. This system is not practical in a resort composed chiefly of single or two-family residences, as was demonstrated in Stone Harbor.

In rechecking those buildings where enumerators found no one at home, the time factor was again important. A movement of population homeward from the beaches began at about 4:30 P.M., and it was found that between 5:30 and 8:00 P.M. most visitors and permanent residents would be home.

Finally, in a high density resort area such as Wildwood, the great complexity of settlement poses the possibility that some dwellings may be overlooked. A property that from the street appears to contain a single-family home may be found to have one apartment on the second floor, a second over the garage, and a small cottage occupying most of the rear yard. Conscientious enumerators are essential in order to obtain accuracy in these cases.

Counting a population that is constantly moving is a difficult task—one that demands enumerators who can adapt to changing situations and think for themselves. The success of a census of resort population depends heavily on the quality and training of the people who do the actual counting. For this reason, enumerators should be selected with care, and similar care should be given to training them for their job.

Results. During the period of July 21-30, 1958, the censuses of Wildwood and Stone Harbor were completed by five full-time and two part-time enumerators who worked some 260 man-hours checking more than 6,000 structures and interviewing over 3,500 persons. Although much could be said about the implications of seasonal population change, this paper will be limited to pointing out only the major findings in the City of Wildwood.

When the census returns for Wildwood were totaled, they revealed that the city had lost 623 permanent residents since 1950. Its population was found to be 4,852 persons, a decline of 11.4 per cent from the 1950 population of 5,475. The U.S. Census of 1960 showed a further decline in year-round population since 1958 and served as a check on the accuracy of the local work.

The summer census of Wildwood further revealed that summer visitors staying in the 1.2 square miles of the resort during the enumeration period ranged from a total of 34,917 on the week-end to 29,473 during the week. Counting permanent residents, Wildwood had a population of about 40,000 people on the week-end. It should be noted that these figures do not take into account those persons who visit the resort for the day only. These visitors swell the daytime population in the resort to a level as yet unmeasured.

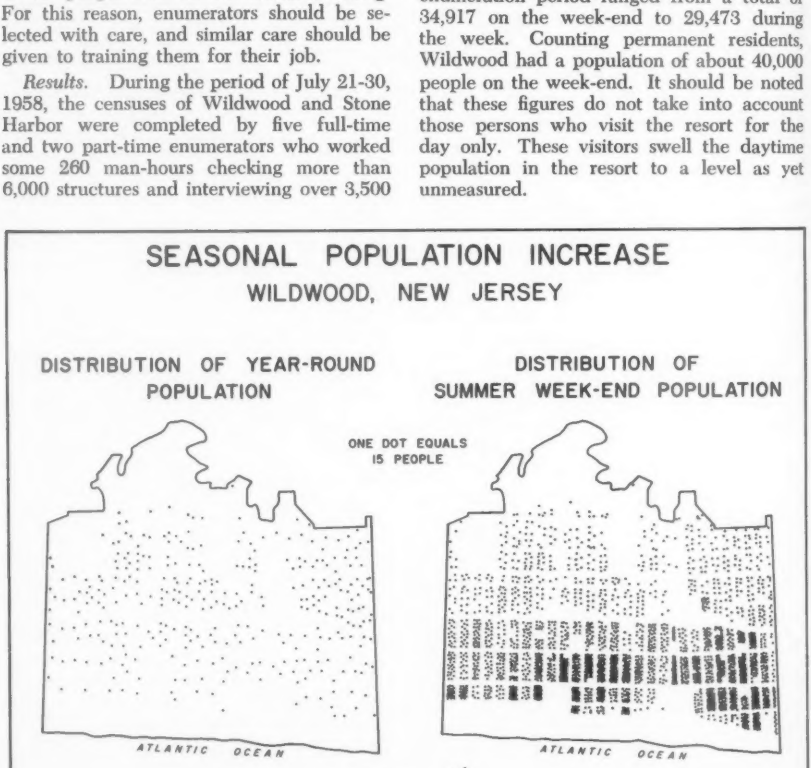


FIG. 2. Seasonal population increase, Wildwood, New Jersey.

This more than eight-fold seasonal increase in population creates densities in Wildwood averaging close to 34,000 persons per square mile during summer weekends—a sharp contrast with the winter population density of some 4,400 persons per square mile. In fact, population density in some parts of the city is over 100,000 persons per square mile. Whether viewed in person or seen on a map, the difference between Wildwood's winter and summer population density is striking (Fig. 2).

The implications of seasonal population increases on the provision of facilities and services are great in any resort area. However, the exact influence of vacation population will differ markedly from one resort to another, depending to a large extent on the character of the resort. For example, the high-density, commercial development of Wildwood has tended to concentrate more than 80 per cent of the vacationers within four blocks of the beach and boardwalk (Fig. 2). This accentuates the problems of congestion which normally accompany seasonal population increases. In contrast, it was found that the low-density, non-commercial resort of Stone Harbor had a much more evenly distributed summer population and that, even though its summer population was 13.5 times higher than that of the winter months, the town had much less of a problem of congestion than did Wildwood.

Conclusion. To date, the above described simple method of measuring resort population has been used successfully in three resorts of Cape May County. Staff members of the Cape May County Planning Board conducted the enumeration of Wildwood and Stone Harbor in 1958, and the staff of the New Jersey State Planning Bureau used the same method to measure the seasonal population of Ocean City in 1959 *(2, 3)*. This summer, a fourth census will be carried out in the City of Cape May, using local residents as enumerators.

All three of the completed resort censuses appear to have been accurate as judged by the returns of the U.S. Census, and they provided essential basic information for local and regional planning purposes. The cost of performing this work locally averaged about one-third the cost of having a special census conducted by the Census Bureau. If similar studies can be completed on a local level in other resort areas, it may be possible to develop a body of data from which more meaningful generalizations on the nature of tourism and resort communities can be made.

* * *

(1) "Census Advisory Committee Report, 1960," *The Professional Geographer*, Vol. XIII, No. 1, January, 1961, p. 25.

(2) *Population*, Cape May County Planning Board, Cape May Court House, N.J., 1958, pp. 93-112.

(3) *Population Study*, Preliminary Master Plan Studies for Ocean City, N.J., New Jersey State Planning Bureau, Trenton, N.J., 1960, pp. 14-17.

LANDFORMS ASSOCIATED WITH STAGNANT GLACIAL ICE

Harold A. Winters

Northern Illinois University

IN AN ATTEMPT to describe landforms resulting from continental glaciation, most textbooks, and probably many geographers and geologists, emphasize landforms constructed by active ice and fail to consider the relative importance of those resulting from stagnating ice. Generally, end moraines and their related landforms are associated with the margin of an active glacier, and ground moraine and its related landforms are associated with construction beneath a retreating ice sheet. A third category of landforms, which results from extensive stagnation of glacial ice, has been largely overlooked and deserves the consideration of those concerned with physiography and geomorphology.

For a considerable period of time, certain landforms associated with stagnant glacial ice have been recognized in North

America and Europe. In New England, for example, kame terraces, abundant eskers, and the absence of recessional moraines all suggest extensive stagnation of the glacial ice. *(1)* More recently, stagnation landforms, or so-called ice disintegration features, of Wisconsin (Wisconsinan) age were found on the western plains of Canada. *(2, 3)* In addition, the writer has studied extensive areas on the Missouri Coteau in North Dakota, where landforms of Late Wisconsin age are interpreted to have resulted from stagnation of glacial ice. Finally, Leighton recently described stagnation landforms associated with areas of Illinoian glaciation in south-central Illinois. *(4)* Because of their distinctive characteristics and widespread occurrence, landforms associated with stagnant ice should, in the writer's opinion, be distinguished from those formed by active ice.

Evidences of an orderly retreat of an active ice margin are not revealed by stagnation landforms. Linear and organized patterns may occur in areas of stagnation, but these are generally believed to be associated with the disintegration of the stagnant ice rather than with an active margin. Great variations in landforms and sediments may occur within short distances and display relatively complex relationships in comparison with type areas of ground moraine or end moraine. These landforms are differentiated on the basis of their form, lithologic type, and relationship to other landforms in the environment. Local relief may vary greatly within areas of stagnation, but differentiation on this basis alone does not appear to result in a meaningful genetic classification. A brief analysis of some of the more significant ice disintegration landforms follows.

Hummocky disintegration moraine. Rugged glacial topography, consisting of closely spaced hills and closed depressions and devoid of an internal or over-all linear pattern, may result from stagnation of glacial ice. These landforms, in which the most abundant material is till and in which relief per square mile may exceed one hundred feet, have been recognized by Gravenor and Kupsch in the western plains of Canada. *(5)* The authors refer to the landforms as hummocky disintegration moraine, and describe them as "a nondescript jumble of knolls and mounds of glacial debris separated by irregular depressions." *(6)* In North Dakota, the writer of this article has mapped several hundred square miles of similar landforms that are also interpreted as stagnation features. In addition, it is conceivable that stagnation landforms may occur over thousands of square miles in that state. Landforms of this nature have, in the past, commonly been mapped as end moraine. This error is understandable since the landforms resemble end moraines in some ways. A differentiation should be made, however, between end moraine and this hummocky stagnation topography because (a) their origin is different, (b) their internal and over-all patterns are different, and (c) additional and smaller scale landforms may occur within areas of stagnation that are not known to be associated with end moraines. Several of these smaller scale landforms are described below.

Perched lacustrine plains. One significant landform occurring within areas of hummocky stagnation topography has been variously referred to as the moraine plateau *(7)*, the dead ice plateau *(8)*, and the perched lacustrine plain (Fig. 1). This landform, which may occur at relatively high elevations, is underlain largely by glaciolacustrine materials. In some instances sand and gravel occur about the periphery of the water-deposited clays and silts. Perched lacustrine plains differ greatly in shape and appear to range from a few hundred feet to several miles in length. The clays and silts may be flat-lying or may display deformation, usually interpreted as slump structures.

Over extensive areas in North Dakota, the perched lacustrine plains are surrounded by hummocky stagnation topography at lower elevations. The higher elevation of the glaciolacustrine sediments indicates that they were deposited by a body of relatively still water restricted, or walled, by stagnating ice. The resulting landform may resemble a plateau-like surface, of high elevation and low local relief, within an area of rugged topography.

Rims. It is not uncommon to find so-called rims either partially or completely surrounding the perched lacustrine plains (Fig. 1). The former features have been observed in the western plains of Canada and in portions of North Dakota. *(9)*

The rims may consist of glacial till or glaciofluvial material. Clays and silts are

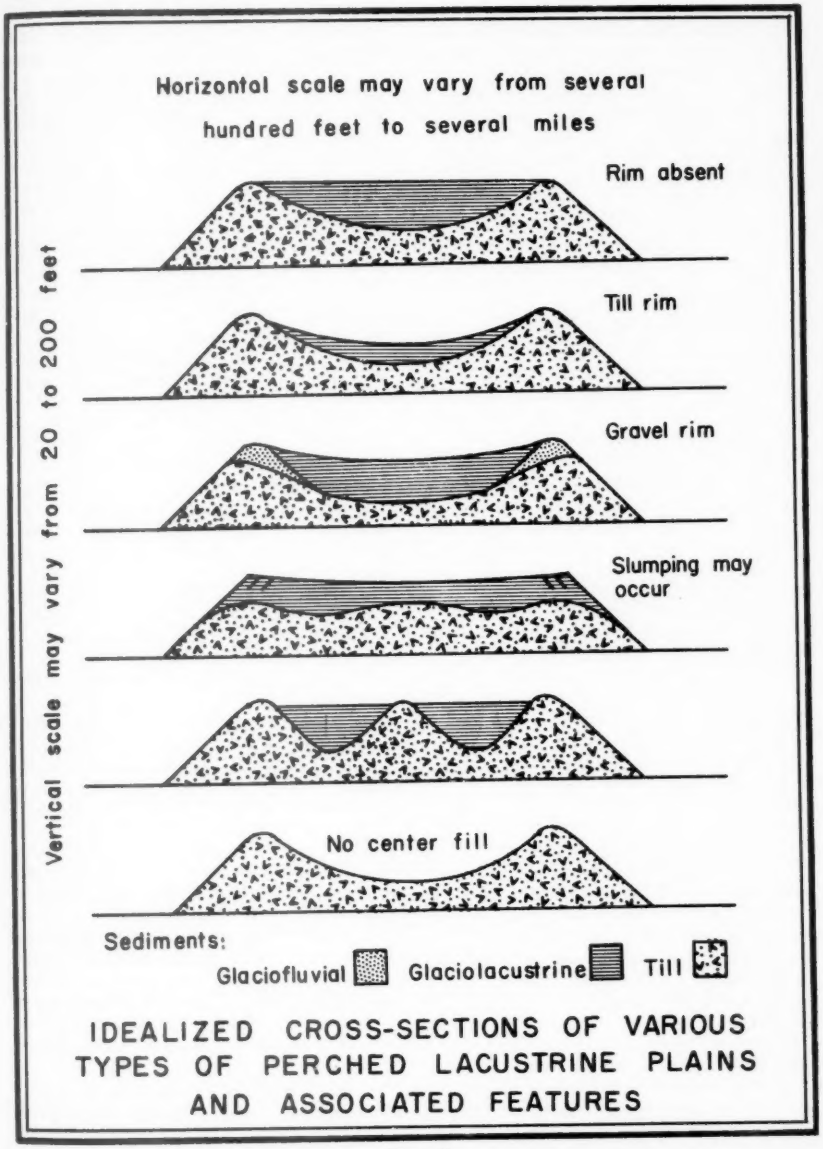

Horizontal scale may vary from several hundred feet to several miles
Vertical scale may vary from 20 to 200 feet
Rim absent
Till rim
Gravel rim
Slumping may occur
No center fill
Sediments:
Glaciofluvial
Glaciolacustrine
Till
IDEALIZED CROSS-SECTIONS OF VARIOUS TYPES OF PERCHED LACUSTRINE PLAINS AND ASSOCIATED FEATURES

FIG. 1

in contact with the drift which forms the inner edge of the rim. The magnitude of the rim appears to be related to three primary factors. These are (a) the original height of the rim, (b) the amount of deposition of lacustrine sediments within the

rim, and (c) the amount of erosion that has occurred since the rim was formed. In the Missouri Coteau portion of North Dakota, the amount of erosion is relatively insignificant, but the other factors appear to be important.

In situations where large amounts of lacustrine sediments have been deposited within the rim, the landform is not overly conspicuous. It might be compared with the upturned edge of a saucer as viewed in profile. In situations where smaller amounts of lacustrine sediments have been deposited within the rim, the landform is more conspicuous and resembles a bowl in profile. It is generally believed that the rim resulted from either the squeezing upward of drift from below the ice, the deposition of drift from the surface of the ice, or a combination of both processes.

Pseudo-eskers. Another significant landform associated with stagnating ice has been recognized in western Stutsman County, North Dakota. This feature is composed of glaciofluvial material which was deposited in the form of channels. The channels may extend from areas of ice stagnation to outwash plains or valley trains. The sand and gravel deposits may be traced for several miles through areas of hummocky stagnation topography. The width of the deposits varies greatly. Maximum widths observed have been in the magnitude of 5,000 to 6,000 feet.

Because of (a) the nondescript nature of the landforms, (b) the areal extent of the sand and gravel, and (c) the minor amount of postglacial erosion, it is believed that the drift was not restricted to tunnels within or beneath the stagnating ice. The landforms cannot properly be referred to as eskers because their configuration does not correspond with the definition of the term. Their origin, however, may be similar to that of an esker, but irregular, elongated ridges of glaciofluvial material are absent.

At present the writer is of the opinion that the glaciofluvial material was deposited by glacial meltwater streams located on the surface of stagnating ice. As stagnation continued, the sands and gravels were superimposed upon the subglacial topography. As a result, much of the surface configuration of the landform was actually inherited from the subglacial topography. The varying width of the glaciofluvial deposits may be partially explained as (a) the result of differential ablation of the ice forming the walls of the channel, (b) local variations in stream gradients, and (c) varying density of tributary streams which supplied sediments.

This landform can be delineated satisfactorily only by careful lithologic mapping, since its surface configuration resembles that of the adjacent hummocky stagnation topography. Yet it is a significant feature in the landscape because the variation in lithologic type encourages variations in soil, vegetation, and ground-water conditions.

Other features. Stagnation landforms are not limited to areas of rugged topography. Leighton, Gravenor, and Kupsch, among others, have described stagnation features associated with terrain of low relief.

Leighton recently concluded that landforms associated with Illinoian drift, which were formerly mapped as end moraines, are actually stagnation landforms. *(10)* Though these landforms, located in south-central Illinois, possess considerable relief within themselves, they occur in an area of relatively low relief, barring postglacial erosion. The landforms recognized by Leighton consist of moulin kames and crevasse fillings.

Gravenor and Kupsch describe so-called disintegration ridges, and attribute them to stagnation of glaciers. *(11)* Disintegration ridges may occur in many patterns which may be observed easily on aerial photographs. Some reveal an orderly circular or linear pattern. Others appear to occur in a random fashion. It is generally agreed that these features have resulted from (a) the superimposition of ablation drift from the surface of the glacier, (b) the squeezing upward of subglacial material into voids at the base of the ice, or (c) a combination of both processes. These landforms differ in size and may be difficult to recognize in the field. They may, however, occur extensively and contribute significantly to the form and magnitude of the local relief of an area.

Conclusion. The landforms mentioned above represent only a partial inventory of stagnation features. As work continues in areas where extensive ice stagnation has occurred, it is probable that the landforms here described will be more clearly understood and defined and that additional landforms, not recognized at this time, will be

classified in terms of form and origin. The major objective of this article is to stress the significance, in terms of areal extent and form, of features resulting from the stagnation of glacial ice so that a more meaningful and accurate description of glacial landforms may be achieved.

* * *

(1) Flint, R.F., "The Stagnation and Dissipation of the Last Ice Sheet," *Geographical Review*, Vol. 19, 1929, pp. 256-289.

(2) Gravenor, C.P. and Kupsch, W.O., "Ice-Disintegration Features in Western Canada," *Journal of Geology*, Vol. 67, 1959, pp. 48-64.

(3) Stalker, A. MacS., *Ice-Pressed Drift Forms and Associated Deposits in Alberta*, Geological Survey of Canada, Bull. 57, 1960, pp. 1-38.

(4) Leighton, Morris M., "Stagnancy of the Illinoian Glacial Lobe East of the Illinois and Mississippi Rivers," *Journal of Geology*, Vol. 67, 1959, pp. 337-344.

(5) Gravenor and Kupsch, *op. cit.*

(6) *Ibid.*, p. 50.

(7) *Ibid.*

(8) Stalker, *op. cit.*, p. 5.

(9) Gravenor and Kupsch, *op. cit.*, p. 51.

(10) Leighton, *op. cit.*, p. 343.

(11) Gravenor and Kupsch, *op. cit.*, pp. 52-60.

CHANGING THE STYLE OF MECHANICAL LETTERING

James A. Bier

University of Illinois

MECHANICAL lettering, because it appears uniform and is simple to construct, has become a major method of labeling graphs and maps in geographical literature. This kind of lettering (Leroy, Doric, Wrico, and others) is superior to the hand lettering of most individuals and is less expensive than typeset copy. In certain instances, use of a Veri-Typer or of pre-printed letter stick-up would make labeling less expensive than by mechanical lettering, but the convenience of readily accessible mechanical lettering equipment favors its continued employment.

To the person familiar with the variety of printing type faces used in publishing, the appearance of mechanical lettering is generally uninteresting and monotonous, especially when there are no variations in size of letter or in line weight, or when no use is made of lower case or italic letters. Frequently, even these embellishments are not enough to make an illustration attractive. The author has been concerned with this problem for some time and has developed several ideas which may be used to improve the appearance of mechanical lettering.

Serifs. One of the simplest ways to change the style of mechanical lettering is to add serifs. These are the short cross-lines placed at the ends of letters in certain styles of type faces. To add serifs is not difficult and can be done by the inexperienced draftsman. The extra time required is little more than that needed to scribe the unmodified letters. Figure 1, parts a and b, illustrates several ways that serifs can be added to vertical and italic letters. A variety of additional styles can be developed, depending on how ornate a design is desired (Fig. 1, part c).

To add serifs, one can use a fine point crow quill or other pen such as a Gillott 1950 Artist. On large sized letters, a ruling pen and a triangle and T-square are necessary to orient lines uniformly. For other ornamentation on the letters, a flexible pen such as an Esterbrook 354 Mapping is best. The kind of pen employed depends on the size of the letters being altered, but the suggested pen points are satisfactory with 24 point (240 Leroy template) or smaller letters.

Serifs can have a horizontal-vertical orientation (Fig. 1, part a); or a more casual and free-hand appearance can be produced by orienting the serifs approximately 30° from the horizontal (Fig. 1, part b). With either orientation, the serifs usually do not extend more than one-half the width of the lines forming the letters.

Line width variations. Another method

FIG. 1

of changing the appearance of mechanical letters is to vary the thickness of the lines which form them. Nearly all printed type is designed so that the lines which make up a letter differ in width. One of the most obvious type faces to illustrate this is the Lydian style (Fig. 2, part a). Hand lettering, using a Speedball C pen or chisel brush, can be made to resemble Lydian if the pen or brush tip is kept at a nearly uniform angle throughout the construction of a letter. A similar appearance can be achieved with mechanical lettering by forming the pen tips into a chisel shape.

FIG. 2

Three distinct styles of lettering can be achieved with a chiseled pen tip by orienting the broad sides of the tip vertically, horizontally, or at a 45° angle (Fig. 2, part b). The 45° angle gives the most pleasing appearance, but the horizontal and vertical positions are useful on maps and graphs when large letters are used. Serifs and other ornamentation may be added to such letters by the method described earlier.

Preparing a chisel point pen. To make a chisel point on a mechanical lettering pen is not as difficult as one may think. The author was able to alter a set of eight Leroy pens in an hour and a half. The tools needed are a fine metal file, a fine-grained Arkansas honing stone, a pair of long nose pliers, and a 10-power magnifying lens. It is best to start with a large pen, such as a Leroy 5 or 6, and work down to the smaller sizes.

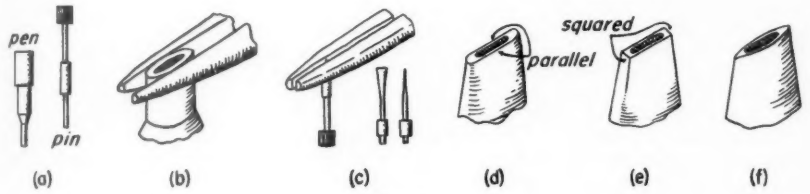


FIG. 3

The steps in preparing a chisel tip are as follows, using a Leroy pen as an example. The cleaning pin is removed from the pen and set aside to be altered later (Fig. 3, part a). Next, the pen tip is squeezed with the long nose pliers until the narrowest width of the hole is approximately the same dimension as the side forming the hole (Fig. 3, part b). It is best to squeeze the tip slowly to avoid cracking it or accidentally closing the hole. The narrower the final chisel shape, the more attractive will be the lettering. One must be careful to leave enough space for the pin to move freely after the pen is altered. The pin is then modified by squeezing the tip to a chisel shape with the pliers (Fig. 3, part c), until it fits the hole in the pen. If the pin is squeezed too much, its width will be larger than the hole and it must be honed or filed down to fit. The broad sides of the pin should be honed slightly to obtain the desired final shape. To fit properly, the pin should project just beyond the pen tip when inserted. Next, the pen is worked into final shape with the file and honing stone. Honing may be needed only on the smaller points. The broad sides of the tip should be honed and/or filed very close to the hole so that the edges are parallel to each other (Fig. 3, part d). The two short sides of the tip should be squared with the broad sides, but only enough metal to make the ends flat should be removed (Fig. 3, part e). The tips on pen sizes smaller than a Leroy 3 should not have their short sides squared; instead, the broad sides should be shaped into a slightly bowed form, keeping as much of the end metal as possible (Fig. 3, part f). Finally, the side of the pen can be marked with paint or a scratch to indicate the broad side of the tip.

Using a chisel point pen. The altered lettering points are used in a scriber in the same manner as normal points, with the exception that the orientation of the tip is considered—vertical, horizontal, or 45° angle. Any time the scriber is used, with normal or altered points, it should be adjusted so that the tip of the pen is just barely off the paper. If the pen rides on the surface of the paper, ink will quickly build up around the tip and paper fibers will accumulate. Wiping the tip frequently will help to give the letters their best appearance.

The pen sizes normally used with a particular template will not apply when using the chisel points. The author has found the following Leroy template-pen sizes to have the best appearance: 60-00, 80-00, 100-0, 120-1, 140-1, 175-2, 200-3, 240-4, 290-4, 350-5, 425-5, and 500-6. The template-pen size combinations may vary a little, depending on how narrow the chisel point has been made.

Conclusion. By using a set of chisel pointed pens and adding serifs, a drafts-

man with little additional effort and skill can expand his choice of mechanical letter styles from two to 13 or more. He thereby can produce more attractive and more easily read illustrations.

WHEN AND HOW SHOULD WE VISUALIZE?

Howard C. Koverman, Jr.

Olin Mathieson Chemical Corporation

The following article is first in a contemplated series dealing with the subject of visual communications for the geographer. The series is an outgrowth of articles and letters to the editor, dealing with the use of visual aids at Association meetings, that have appeared in recent issues of this periodical.

FEW PEOPLE dispute the fact that visuals are recognized and permanent features of the art of presentation. However, choosing or making the correct type of visual for a given situation is often a perplexing task. Often it is done haphazardly and with disappointing results. In a field as new as visual communications, such deficiencies are understandable; but they can be avoided if one has a little knowledge of the reasons for using visual materials and the ramifications of their use under various conditions.

As an approach to the problem of when and how to visualize, it is important to understand the nature of visuals and how they function, without regard to any particular medium or subject matter. Thus, we find that functionally there are three categories of visuals: (a) those that supplant the speaker; (b) those that supplement the speaker; and (c) those that complement the speaker.

Each of these categories has definite value in the realm of presentation, but not all are equally suitable at a given time or place. This becomes clear as each category is examined in terms of the media and devices of presentation that are used.

Supplanting visuals. In some types of presentations, the speaker plays a relatively minor role. He serves as an introduction or point of departure, from which the visual takes over and carries itself. Usually, the speaker also serves to summarize and conclude the presentation.

Motion pictures and filmstrips are media which offer an almost infinite scope of material that can be presented in this manner. The sound track or captions clarify details not obvious in the pictures and serve to maintain continuity, thus supplanting the major role of the speaker. Further, motion pictures and filmstrips require considerable darkness to achieve the brilliance and clarity for which they were designed. In this state, eye to eye contact between the speaker and audience is lost, further diminishing the effectiveness of the speaker.

Any intrusion by the speaker during the showing of a film is not only ineffectual, but distracting. Therefore, when films are used, the speaker must rely on their quality and ability to convey his thoughts to the audience.

Supplemental visuals. Visuals in the second category — those that supplement the speaker — help him carry the burden of the presentation. Although such devices may take a wide variety of forms, the most common types are slides and demonstrations.

When slides are used the speaker must provide the continuity, bridging from one scene to the next, and at the same time fill in any relevant details that the pictures on the screen do not clearly show. Slides, too, require considerable room darkness, thereby reducing the contact between the audience and the speaker. For this reason, slides are probably the most difficult type of visual to employ.

Demonstrations, on the other hand, usually help to concentrate attention on the speaker and relieve him of explaining the

TABLE

USE OF SELECTED TYPES OF VISUAL AIDS

	Category										
	I		II		III						
	Motion Pictures	*Filmstrips*	*Slides*	*Demonstrations*	*Overhead Projections*	*Flip Charts*	*Flannel Boards*	*Models*	*Wall Charts*	*Blackboards*	*No Visuals*
Small Classroom	....	X	....	....	X	X	....	....	X	X	....
Large Classroom	X	X	X	X	X	....	....	....	....	....	....
Geography Laboratory	....	....	....	X	....	X	X	X	X	X	....
AAG Technical Session	....	....	....	....	X	X	X	....	X	....	....
AAG General Session	....	....	....	....	X	....	....	....	....	....	X
Dinner Meeting	....	....	....	....	....	....	....	....	....	....	X
Non-Professional Meeting	X	....	X	....	....	....	....	....	X	....	....

obvious. Difficult phases or subtleties become apparent with a minimum of words. The end result is a pleasing and effective balance of information reaching the ears and eyes of the audience.

Complemental visuals. Visuals of the third category complement the speaker by emphasizing or clarifying certain points without diverting attention from the speaker. Overhead projection, flannel boards, flip charts, and even the lowly blackboard are examples of media in this category because they operate at room illumination and are under the direct control of the speaker.

Visuals of this type are simple, brief, and effective. They must be designed and executed as an integral part of a presentation, and not as an afterthought. Visuals of the complemental type require careful preparation, but they are the easiest to use and allow a smooth and relaxed presentation.

No visuals. The above three categories cover all possible methods of visual presentation, but there is a fourth situation which is of equal importance. That is the presentation where no visuals are used.

It simply does not follow that, because visuals are valuable in some cases, they should be used in every case. If a proposition can be adequately verbalized, why visualize it? In such an instance the visual, no matter how good it is, will detract from the oral presentation. Also, there are places, such as banquet halls, where visuals are difficult to use. In these, and all other situations, when in doubt about using a visual, leave it out.

Summary. In summary, it can be seen that visuals are tools to be used by the speaker in the preparation and delivery of a presentation. Visuals, in common with all other good tools, have a definite purpose; and, like other tools, the end product is a result of the skill and ability of the user.

As an aid in selecting the right tool, the above table lists situations in which a professional geographer may be required to make a presentation. The most appropriate types of visuals are listed for each situation. These recommendations should not be construed as hard and fast rules; but, as time proven guides, they should be of value in keeping the presentation simple, coherent, and effective.

BEWARE OF DIAGONAL LINES IN BAR GRAPHS

Gwen M. Schultz

University of Wisconsin

ONE OF THE most commonly used patterns in bar graphs is, oddly enough, one of the most difficult to use effectively – the diagonal, parallel line or stripe.

This pattern is popular probably because it reduces and reproduces clearly and sharply, is easily distinguishable, and easily applied. But it has its drawbacks. A pattern of strong, parallel lines is not only uncomfortable to look at due to the harsh, pulsating effect it has on the eyes, but it is also tricky to work with. It creates disturbing optical illusions. Even though we may be aware of this fact, it is well to remind ourselves of it from time to time.

In the illustration, "Which Bars Tilt?", the slanting lines within the bars make it appear that some bars tilt one way, and

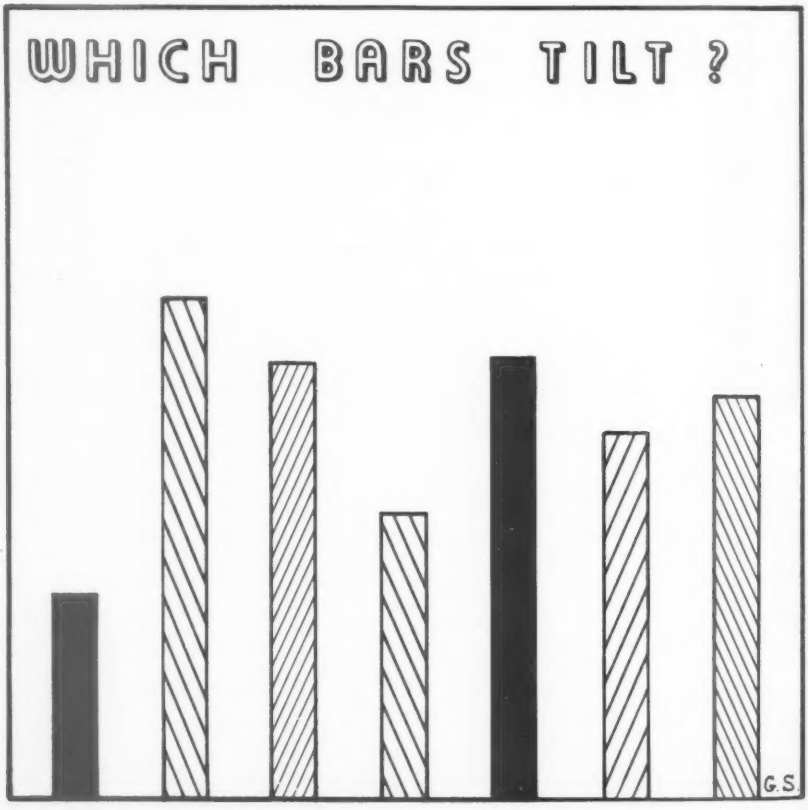


FIG. 1

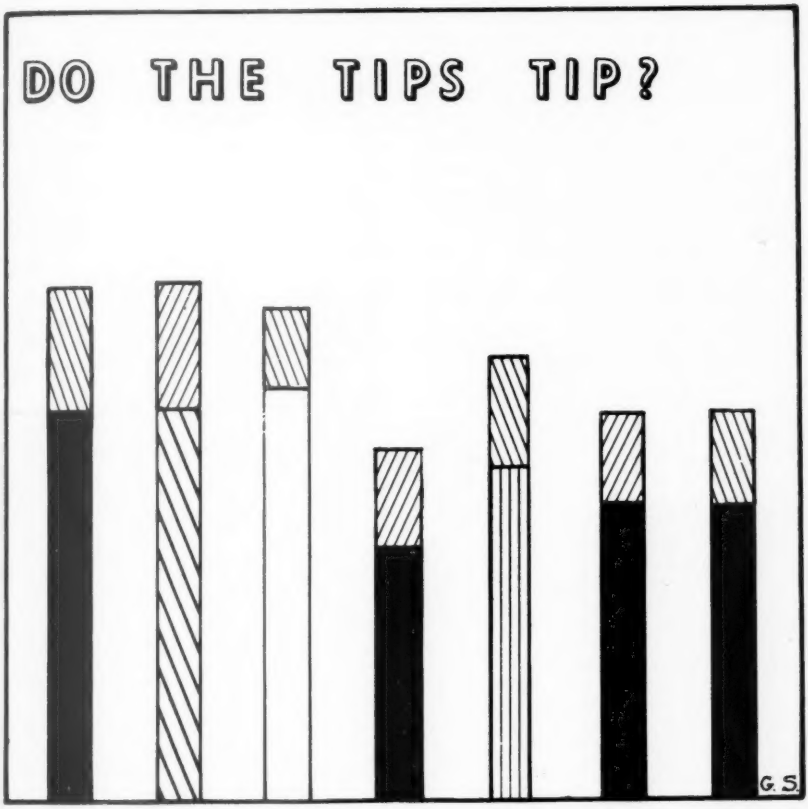


FIG. 2

others the opposite way (Fig. 1). Actually, all bars are uniformly straight. The reader, to satisfy himself of this, might measure the distances between the bars at both their tops and bases, but a simpler method is to squint just enough to blur out the diagonals and thus eliminate their effect. Then it becomes evident that the bars do not tilt.

In the illustration, "Do the Tips Tip?", all bars are again uniformly straight (Fig. 2). But notice how even a section of diagonal striping in a subdivided bar can make the bar appear to bend.

How does one avoid this illusion of tilting and tipping? The diagonal lines might simply be swung about to either a vertical or horizontal alignment; yet, this is seldom done because diagonals are supposed to be more interesting. Or one might substitute solid black or white bars which, though plain, are perfectly acceptable. If more variety is needed, there is a wide selection among the numerous shadings of smooth dots and the many other restful, innocuous patterns. Why take risks with an unpredictable pattern when there are so many reliable and more attractive ones to use?

SOME THOUGHTS ON GEOGRAPHY OF THE FUTURE

Lane J. Johnson
Wayne State University

IN HIS RECENT article *(1)*, Hans Carol proposes a system of geography composed of elements already well established within the field plus some less established and more controversial elements. The present essay is an attempt at a critical examination of this system, admittedly from the point of view of one geographer. More specifically, it is an adverse criticism. Although this writer finds much merit in some of the concepts contained in the article, he feels compelled to point out what he considers weaknesses of the proposed system.

Major criticisms. Carol evidently feels that a geography that studies patterns of the association of phenomena in space, or the differentiation of areas, is not sufficient. "A legitimate field of scientific inquiry is characterized by . . . a distinctive domain, i.e., the kind of reality on which it focuses . . ." In the Carol system, an exactly defined reality to study is provided by the concept of the earth shell, or *geosphere*.

Unfortunately, this writer can only conclude from the tone of the article that as Carol uses the term reality it is synonymous with *object*, a word used only sparingly in the article under discussion here, but used commonly in his article of 1959. *(2)* Thus, the geosphere, besides being a reality in the common sense of that word, is in effect an object of study.

Assuming the correctness of this interpretation, and exclusive of the problem of whether it is necessary or desirable that geography be labeled a science, two criticisms may be raised at this point. First, it is doubtful that the earth shell can be considered an object similar to those studied by other sciences. If an object, its uniqueness alone makes it different from the phenomena investigated by most disciplines. Second, that a science must have an object of study is open to question. Such a conclusion necessarily must rest upon one's assumption as to the nature, i.e., definition, of science. This writer, for instance, has always felt that science is basically a method of study, rather than a field whose status is determined by the object of its investigation, or for that matter the results of its investigation.

The geosphere, which Carol presents for analysis by geographers, is a three dimensional object involving the whole of the earth's surface and extending above it to the upper limits of the stratosphere and below it to the Mohorovicic Discontinuity for a total depth of about 75 miles. The particular limits, seemingly the results of an attempt to arrive at an object of study, are not so disturbing as is the fact that it was felt necessary to establish any precise limits at all. Are we to assume that a system of satellites maintaining a height just above the upper limit of the geosphere is not of significance to the military geographer? One might well feel, as does this writer, that the rather vague term *surface*, as traditionally used by geographers, is more desirable than is the precise term geosphere, which could quite possibly eliminate from consideration significant material of geographic interest. Thus, the geosphere appears to involve certain dangers of restrictiveness, as well as having questionable standing as an object.

Even more vulnerable to criticism is that building block of the geosphere, the geomer. "Any segment of the geosphere, regardless of its size, is a geomer, as long as it includes all that exists between the rock underneath and the air above. . . . Geomer is the precise term corresponding to such rather meaningless words as area and place . . ." How a geomer can correspond to area and place, and yet be precise rather than meaningless, is not explained. Geomer is much less meaningfully defined than is region. Geomer includes region, but also includes arbitrarily defined areas. Thus, it is a step backward from one of geography's most useful tools. This writer can think of no instance in which the serious study of an arbitrarily defined area, or areas, would be as meaningful in nature and logical in approach as would be the study of a suitable (in terms of the study's aims) region or system of regions. An infinite number and combination of geomers pose, for classification and study, problems even greater than

those inherent in an infinite number of possible regions. Also, the implication that understanding of the geosphere will result from an understanding of geomers appears to rest upon the questionable assumption that in this case the whole is no more than the sum of its parts.

This writer also must object to Carol's proposed approach to the analysis of the geosphere and its component geomers. The new geography is to be studied historically in a much more elaborate fashion than merely using historical factors to explain spatial patterns. "Geography will trace the development of the geosphere, from its inorganic beginnings some billions of years ago, through its organic stages, to the various phases of present human occupance . . ." One who considers geography to be essentially spatially oriented might find such studies more properly placed within fields such as history and historical geology; though they may find the topic interesting, students of anatomy do not consider it necessary to orient their studies towards man's evolution.

Other criticisms. The above are the most serious criticisms of concepts contained in "Geography of the Future." The article also raises some questions of lesser import.

Carol proposes elimination of the systematic-regional dualism in geography by means of doing away with the systematic; it is, he implies, the proper realm of the various systematic sciences. This proposal may be countered by two arguments. First, there is no particular danger in this dualism if it is viewed in the perspective of being an artificial division of knowledge and of approach primarily for reasons of convenience. Second, while each systematic discipline "is interested not only in the general aspects of the field but also in the areal distribution of its pertinent phenomena over the globe," this does not mean that each systematic discipline is going to interpret exhaustively the geography of the pertinent phenomena, including areal associations with other phenomena. The systematic sciences are primarily phenomenologically oriented and will likely so remain.

Also, the either-or implication with which the article is concluded is disturbing. Geography is a broad, vigorous field with numerous frontiers. It is possible to conceive of its developing in any of various ways in the future. Carol's proposal is merely one possibility.

The geography of the present. All of the above are criticisms of some of Carol's thoughts as expressed in his article. The article, of course, contains a number of ideas with which this writer agrees. As regards these, however, he feels that Carol tends to underestimate the geography of the present. The implication often seems to be that attributes already possessed by geography are yet to be attained.

For instance, it is stated that the findings of the new geography will be interpreted in the light of relevant data regardless of the field of origin of the data. "It will be taken for granted that . . . it will be essential to use the knowledge of all relevant systematic sciences . . ." Hasn't worthwhile scholarship, including that in geography, long followed this approach?

Also, most geographers likely would not now call their field merely "the science of distribution" or feel that its major purpose is to perform an "auxiliary function as handmaid to other fields." Nor would they feel that it is their duty to build the "bricks" of which geography is composed if other fields have already satisfactorily accomplished this task, and quite often they have. Moreover, do not geographers teaching elementary courses select carefully factors which, "according to their importance to geography as a whole," they consider most significant for the attention of their students? Also, it is likely that fewer and fewer geographers are making use of the rather successfully demolished total region concept. It might also be doubted that the activities of geographers are so diverse that there is not cohesion among them to the degree necessary that they can be considered members of a "well-defined" field. While geography is not *necessarily* what geographers do, efforts outside of any logical limits of the field are not particularly difficult to assess as such.

Carol's divisions of the field are neither particularly new, detailed, nor complete. His position on the importance of physical geography is well taken, as is his position on the importance of developing "a set of intellectual working tools, concepts, and terms appropriate for comparative analysis." These feelings are not uncommon to present-day geography, but certainly they can stand continued emphasis.

As for the *geography* of other bodies than the earth, this is a question we may be facing soon. It poses no particularly serious problem if our semantics can be stretched a bit. Or, we may be needing terms such as *Marsography*. Certainly these other bodies have something the equivalent of our earth's geography in their own right.

Conclusions. This essay is a criticism of some of the more important concepts discussed by Hans Carol. Aspects selected for discussion are mainly those to which this writer finds himself most opposed. With many of Carol's ideas the author is in basic agreement, and some of the shortcomings mentioned here may be due to the space to which Carol was restricted in his article. Certain points might have been cleared up by more discussion.

However, in summary it may be said that this writer's reaction to Carol's proposals was generally negative. The writer feels that geography is in a much stronger, more secure, and more advanced position than Carol apparently feels, and that Carol's proposals are largely steps in the wrong direction. Geography is a vigorous, growing field – science if you like. That it is in nature correlative, among phenomena in space, rather than phenomenological, is not necessarily a weakness. Its function, like that of history, is a valuable one. This writer believes that the field, expanding in number of members, is also on the verge of growth in quality and quantity of contribution – a growth which would not be aided by Carol's proposed changes.

* * *

(1) Carol, H., "Geography of the Future," *The Professional Geographer*, Vol. XIII, No. 1, January, 1961, pp. 14-18.
(2) Carol, H., "Current Geographic Thought in the German Language Area," *The Professional Geographer*, Vol. XI, No. 5, September, 1959, pp. 11-15.

THIS COLUMBUS-CAICOS CONFUSION

Edwin Doran, Jr.
Agricultural and Mechanical College of Texas

THE CONTINUED discussion of Columbus' first landfall in the Western Hemisphere, most recently by Fuson in *The Professional Geographer (1)*, illustrates the curious tenacity with which some debates continue in disregard of the law of diminishing returns. Despite Morison's definitive work *(2)*, a scholarly study with the great merit of field verification of the descriptions in Columbus' journal, the subject refuses to expire. Links' theory of 1958 *(3)*, and Roukema's rebuttal of 1959 in favor of Morison *(4)*, may be added to the list of arguments still belaboring the issue.

The reason for this amazing viability evidently lies in the fact that no completely uncontradictory course for Columbus' first fortnight in America can be deduced from his journal. It can be stated with conviction, however, and after still another careful re-study of the evidence, aided by field work in the entire area of dispute, that the Morison version has fewer unexplained facts than any other. The light which Columbus "saw" late on the night of October 11, when still many miles out of sight of land, is one. In this case, it is easier to believe in an hallucination or shady trick to gain the reward for himself than to make the entire following two weeks fit a Procrustean frame based on an actual position off Grand Turk. The question about different units of measure on land and sea may never be answered. But, to establish Columbus' locations, it is more productive to depend on courses sailed and times they required, about which there are voluminous and evidently accurate data, rather than quibble about the sizes of islands as estimated by Columbus in units of uncertain length from dead reckoning.

This note makes no attempt to elaborate on an exposition already presented most adequately by Morison. It is simply an effort to return to the latter's clear position of 1942, a view confused somewhat

by later writing on the subject. If it can be shown in a short span, by means of six clear cut examples of obvious and unmistakable error on the part of Fuson, that the latter has misread critical parts of the evidence, enough in fact to discredit his entire hypothesis, then perhaps we can cease debating the issue. Since small sketch maps would obscure the following discussion, the reader who wants to make a dispassionate judgment must employ a modern chart or map on a scale of at least 1:1,000,000 while analyzing the points to be made.

Error No. 1: In order to substantiate his claim that Acklins Island rather than Long Island is the *Fernandina* of Columbus, Fuson states that "The western coast of the island runs southwest to northeast." *(5)* What he means by the term western coast is unclear, but it is obvious that he is attempting to establish a southwest-northeast trend which matches that of Acklins. Columbus, however, states explicitly in two places and indirectly in a third concerning his actions on the night of October 17 that the trend of *Fernandina* is "Nornorueste y Sursueste." *(6)* This certainly translates into north-northwest–south-southeast, a trend unapplicable to Acklins but fitting Morison's choice of Long Island quite well.

Error No. 2: Fuson in two places mentions the southwest tip of *Fernandina*. *(7)* But Columbus clearly describes it as southeast: "cabo de la isla de la parte del Sueste." *(8)* This is significant in terms of the orientation of the island and for identification of it as Long Island rather than Acklins.

Error No. 3: *Isabela* is stated by Fuson to be southeast of *Fernandina*. *(9)* Columbus states that he had sailed a "Leste-Oueste" course from *Fernandina* to *Isabela*. *(10)* By this he evidently meant a west-east course, but there is no question of the orientation of the course line. The point at issue here is whether Columbus sailed from the southwest end of Acklins to the northeast end of Great Inagua, a course very close to southeast (Fuson), or whether he sailed from the southeast end of Long Island to the northwest end of Crooked Island, an easterly course (Morison). Incidentally, the position of Long Island is shown incorrectly on Fuson's Figure 1.

Error No. 4: In this same connection, Fuson commits a serious error of omission of evidence. Columbus states that he sailed from *Fernandina* at dawn, in less than three hours ("antes que andasemos tres horas"), saw the island of *Isabela* off to the eastward, and reached it with all three vessels before noon. *(11)* Since Crooked Island passage is only 27 nautical miles wide, and the hills on northwestern Crooked Island are as much as 200 feet high, this is a conceivable accomplishment, after leaving Long Island, for 15th century vessels whose maximum speed must have been less than 10 knots. But if he had sailed from the southwest end of Acklins, as Fuson would have it, and had made a full 30 nautical miles of easting he would have been well out in the middle of Mayaguana Passage without the slightest chance of seeing land, for his position would have been at a point 33 nautical miles from Mayaguana and a full 60 nautical miles from the low northeast end of Great Inagua. In the time that he states clearly as lapsing, Columbus could not possibly have covered the distance from Acklins to Inagua, and would have had to sail southeast to do so rather than east.

Error No. 5: On Fuson's map he shows Columbus' course on October 24 and 25 as west-northwest. *(12)* Columbus states for the 24th that he "navegue fasta el dia al Ouesudueste." After calms until noon, fresh breeze in the afternoon (no course stated), and lying hove-to all night, he continued on the 25th "al Oueste-Sudueste" and then to the "Oueste." *(13)* If sailed from Inagua, this course (west-southwest and later west) could not possibly have brought him to the *Islas de Arena* (Ragged Island and neighbors) where Fuson reunites courses with Morison.

Error No. 6: Fuson states "there is no *isleo* off the northeast cape" of Acklins-Crooked. *(14)* True, but Columbus describes the *isleo* only as being in the north part, *not* northeast, of *Isabela*. *(15)* There is a very definite and obvious *isleo*, Bird Rock, off the northernmost point of Crooked Island, that is, the northwest cape.

These six specific errors make Fuson's hypothesis quite untenable. May we now allow the discovery monument to remain on Watling's Island, the *San Salvador* of Columbus?

• • •

(1) Fuson, Robert H., "Caicos: Site of Co-

lumbus' Landfall," *The Professional Geographer*, Vol. XIII, No. 2, March, 1961, pp. 6-9.

(2) Morison, Samuel Eliot, *Admiral of the Ocean Sea*, Boston, 1942.

(3) Link, Edwin A. and Link, Marion C., "A New Theory on Columbus' Voyage Through the Bahamas," *Smithsonian Miscellaneous Collections*, Vol. 135, No. 4, 1958, 45 pp.

(4) Roukema, E., "Columbus Landed on Watling's Island," *American Neptune*, Vol. XIX, 1959, pp. 79-113.

(5) Further references to Fuson's article will be abbreviated, as this one, to Fuson, p. 8.

(6) Navarrete, Martin Fernandez de, *Biblioteca de Autores Espanoles, Tomo LXXXV, Obras de Don Martin Fernandez de Navarrete, I*, Madrid, 1954. Further references to this edition containing Navarrete's reproduction of Columbus' journal will be abbreviated, as is this one, to Nav, pp. 99, 100, 101.

(7) Fuson, pp. 8, 9.

(8) Nav, p. 101.

(9) Fuson, p. 8.

(10) Nav, p. 102.

(11) Nav, p. 101.

(12) Fuson, p. 8, Fig. 1.

(13) Nav, pp. 104, 105.

(14) Fuson, p. 9.

(15) Nav, pp. 101, 104.

ANNUAL MEETING
of the
ASSOCIATION
OF
AMERICAN GEOGRAPHERS

East Lansing, Michigan
Aug. 28 - Sept. 1, 1961

ASSOCIATION AFFAIRS

PRELIMINARY PROGRAM

AAG 1961 EAST LANSING MEETINGS

Kellogg Center
Michigan State University Campus

The following is a preliminary program, with some positions as yet unfilled. The final and complete program will be distributed at the meetings.

SUNDAY, AUGUST 27, 1961

6:00 - 9:00 p.m.
REGISTRATION, Kellogg Center Lobby

MONDAY, AUGUST 28, 1961

9:00 a.m. - 4.00 p.m.
URBAN DISPERSAL IN METROPOLITAN LANSING, FIELD TRIP — A.K. Philbrick, leader

8:00 a.m. - 9:00 p.m.
REGISTRATION, Kellogg Center Lobby

4:00 - 6:00 p.m.
MICHIGAN STATE UNIVERSITY CAMPUS TOURS
(Buses will leave Kellogg Center at 4:00 and 5:00 p.m.)

4:30 - 6:30 p.m.
OPEN HOUSE, MSU DEPARTMENT OF GEOGRAPHY, Natural Science Building

7:45 p.m.
GENERAL WELCOMING SESSION, Auditorium
Main address — *The University, The Disciplines and the World*
Paul A. Miller, Provost, Michigan State University

9:00 p.m.
RECEPTION, Big Ten Room

TUESDAY, AUGUST 29, 1961

8:30 - 11:30 a.m. (Three Concurrent Sessions)

A. PHYSICAL GEOGRAPHY, Lincoln Room
Edwin H. Hammond (Univ. of Wisconsin), Presiding

1. Harry P. Bailey (Univ. of California, Los Angeles) — *On Recognition of Temperate Climates.*
2. Dieter Brunnschweiler (Michigan State Univ.) — *Synoptic Climatology of Michigan.*
3. Karl W. Butzer (Univ. of Wisconsin) — *Remarks on Soil Erosion in Spain.*
4. John J. Hidore (Univ. of Wisconsin) — *Variations in Mean Runoff, Runoff-Precipitation Ratios and Runoff Variability in Iowa.*

5. Calvin J. Heusser (American Geographical Society) and Melvin G. Marcus (Rutgers — The State Univ.) — *Short Term Fluctuations of Lemon Creek Glacier, Alaska, and Their Relationship to the Meteorological Record: 1953-1958.*
6. Theodore H. Schmudde (Southern Illinois Univ.) — *Characteristics of Surface Configuration, Soil Texture and Natural Drainage on the Middle Mississippi River Floodplain.*

B. SPECIAL PROBLEMS IN LAND USE, Room 106
Edward G. Pleva (Univ. of Western Ontario), Presiding

1. James R. Anderson (Univ. of Florida) — *Toward More Effective Methods of Obtaining Land Use Data in Geographic Research.*
2. George F. Deasy (Pennsylvania State Univ.) — *Pennsylvania's Bituminous Coal Strip Pits as Sites for Sanitary Landfills.*
3. Arthur H. Doerr (Univ. of Oklahoma) — *A Preliminary Survey of Plant Succession on Coal Mine Spoil in Oklahoma.*
4. Gordon J. Fielding (Univ. of California, Los Angeles) — *Dairy Cities in Southern California: Dairying in Cities Designed to Keep People Out.*
5. Phyllis R. Griess (Pennsylvania State Univ.) — *Pennsylvania's Anthracite Waste Lands as a Potential Tourist Attraction.*
6. Mary Megee (Arrow Research Associates) — *The East St. Louis Industrial Area: The Vacant Land and the Areal Image.*

C. POPULATION AND SETTLEMENT, Auditorium
Glenn T. Trewartha (Univ. of Wisconsin), Presiding

1. David Lowenthal (American Geographical Society) and Lambros Comitas (Columbia Univ.) — *Emigration and Depopulation: Some Neglected Aspects of Population Geography.*
2. Alfred H. Meyer (Valparaiso Univ.) — *Areal Man in Demographic Perspective.*
3. Richard L. Morrill (Univ. of Washington) — *Local Migration and Urbanization in Sweden.*
4. Malcolm A. Murray (Miami Univ.) — *The Geography of Death in England and Wales.*
5. Allen K. Philbrick (Michigan State Univ.) — *The Dispersed City in Michigan.*
6. Joseph E. Schwartzberg (Univ. of Pennsylvania) — *Agricultural Labor in India: A Regional Analysis with Particular Reference to Population Growth.*

1:30 - 3:30 p.m. (Three Concurrent Sessions)

A. TRANSPORTATION, Lincoln Room
Edward J. Taaffe (Northwestern Univ.), Presiding

1. Jane Lancaster (Barnard College, Columbia Univ.) — *A Railroad to Great Slave Lake.*
2. G. Etzel Pearcy (Department of State) — *Air Route Patterns.*
3. Otto W. Pongrace (New York Central Railroad) — *Geo-Economics of Railroad Industrial Development.*
4. William H. Wallace (Univ. of New Hampshire) — *The "Bridge Line" in the Anglo-American Railnet.*
5. Bogdan Zaborski (Univ. of Ottawa) — *Smooth Flow Traffic Pattern and the Civil Defence.*

B. QUANTITATIVE METHODS, Auditorium
H.H. McCarty (State Univ. of Iowa), Presiding

1. Leslie Curry (Univ. of Maryland) — *Some Elements of a Random Spatial Economy.*
2. Arthur Getis (Michigan State Univ.) — *Potential Accessibility and the Location of Retail Establishments.*

3. Peter R. Gould (Syracuse Univ.) — *A Factor Analysis of Economic Health in New York State.*
4. Lewis T. Reinwald (Radio Corporation of America) — *A Computer for Geographers.*

C. MIDDLE AMERICA, Room 106

....., Presiding

1. James I. Culbert (New Mexico State Univ.) — *Manufacturing Industries of Juarez, Mexico.*
2. J. Granville Jensen (Oregon State Univ.) — *Observations on Agrarian Land Reform in Mexico, 1960's.*
3. Richard V. Smith (Miami Univ.) — *The Distribution of Manufacturing and Population Change in Puerto Rico.*
4. John Thompson (Stanford Univ.) — *The Production and Marketing of Cattle in El Salvador, C.A.*

4:00 - 5:30 p.m.
SPECIAL PARTIES
Syracuse University
University of Wisconsin

3:30 - 6:30 p.m.
MICHIGAN STATE UNIVERSITY CAMPUS TOURS (Buses will leave Kellogg Center at 3:30, 4:30, and 5:30 p.m.)

4:00 - 6:30 p.m.
OPEN HOUSE, MSU DEPARTMENT OF GEOGRAPHY, Natural Science Building

7:45 p.m.
PLENARY SESSION, Brody Multipurpose Room
(Program arranged by the President.)

Current Trends in Geographic Thought

Chairman: Jan O.M. Broek

Panel Speakers:

Brian J.L. Berry
David Lowenthal
William Warntz
Fred E. Lukermann

WEDNESDAY, AUGUST 30, 1961

7:15 a.m.
SPECIAL BREAKFASTS
Clark University
University of Washington

8:30 - 11:30 a.m. (Three Concurrent Sessions)

A. PANEL DISCUSSION, Room 106

Atlas of Early American History
(A Project of the Institute of Early American History and Culture)

Gary S. Dunbar (Univ. of Virginia), Presiding

Panel Speakers:
Lester J. Cappon (Institute of Early American History and Culture)
A. Philip Muntz (National Archives)
Walter W. Ristow (Library of Congress)

B. PANEL DISCUSSION, Auditorium

Geography in the High School

(Sponsored by the Joint Committee on Education of the AAG-NCGE, Gilbert F. White and Clyde F. Kohn, Co-Chairmen)

C. OPEN MEETING OF THE MILITARY GEOGRAPHY COMMITTEE, Lincoln Room
Louis C. Peltier (Midwest Research Institute), Presiding

1. Louis C. Peltier – *The Potential of Military Geography.*
2. A.H. Jackman (Western Michigan Univ.) – *Whither Military Geography?*
3. R.B. Johnson – *The Use of a Geographic Based Matrix as a Tool in Long Range Military Systems Planning.*
4. W.E. Grabau – *The Description of Vegetation for Military Purposes.*
5. R.D. Campbell (George Washington Univ.) – *An Academic Course in Regional Intelligence.*

12:00 noon.
SPECIAL LUNCHEONS
U.C.L.A.
Pennsylvania State University
University of Illinois

1:30 - 3:30 p.m. (Three Concurrent Sessions)

A. LATIN AMERICA, Room 106
James J. Parsons (Univ. of California), Presiding

1. John P. Augelli (Univ. of Kansas) – *The Rimland-Mainland Concept of Culture Areas in Middle America.*
2. Donald R. Dyer (Univ. of Florida) – *Population and Elevation in Peru.*
3. Edmund E. Hegen (Univ. of Florida) – *Highways to El Dorado: A Report on Six Andean Roads into the Upper Amazon Basin.*

B. URBAN GEOGRAPHY, Auditorium
John W. Alexander (Univ. of Wisconsin), Presiding

1. S. Reza Ahsan (Univ. of Florida) – *Gainesville's Northern Fringe: A Geographic Study of a Multiple Use Suburb.*
2. Hans Carol (Univ. of Cincinnati) – *Alternative Concepts to the Urban Sprawl.*
3. Ying-Cheng Kiang (Eastern Illinois Univ.) – *A New Method of Classifying Cities.*
4. Neil M. McArthur (Univ. of Maryland) – *Lakeland, A Setting for Grass Roots Urban Rehabilitation.*

C. POLITICAL GEOGRAPHY, Lincoln Room
A. E. Moodie (Northwestern Univ.), Presiding

1. James M. Hunter (Georgetown Univ.) – *The Extent of the Legal Confines, the State-Idea, and the Zone of Function of France and Germany in the Saarland.*
2. M.E. Marts (Univ. of Washington) – *Basin Development Approaches and Geographic Diversity in the Columbia River Basin.*
3. Roy I. Wolfe (Univ. of Washington and Ontario Dept. of Highways) – *Transportation and Politics: The Example of Canada.*

3:30 - 5:00 p.m.
BUSINESS MEETING, Auditorium

6:00 p.m.
SPECIAL DINNERS

7:45 p.m.
PLENARY SESSION, Brody Multipurpose Room

Commemorating the 50th anniversary of appearance of Miss Semple's *Influences of Geographic Environment.*

Chairman: Preston E. James

1. Ruth E. Baugh – *Ellen Churchill Semple, the Great Lady of American Geography.*
2. Edward A. Ackerman – *Some Geographic Concepts of Ellen Churchill Semple: Their Meaning Today.*
3. Charles C. Colby – *Semple's Scholarship: Then and Now.*
4. John K. Wright – *"Influences of Geographic Environment," Notes Toward a Biblio-Biography.*
5. Jan O.M. Broek – Comments.
6. Richard Hartshorne – Comments.

THURSDAY, AUGUST 31, 1961

7:15 a.m.
SPECIAL BREAKFASTS

8:30 - 11:30 a.m. (Three Concurrent Sessions)

A. POPULATION GEOGRAPHY OF UNITED STATES, Lincoln Room
....., Presiding

1. John Fraser Hart (Indiana Univ.) – *Some Components of Population Distribution in the Middle West in 1950.*
2. Herbert G. Kariel (State Univ. of Iowa) – *Some Aspects of the Spatial Distribution of Population Change in the West North-Central States.*
3. Arthur E. Karinen and David W. Lantis (Chico State College) – *The Population of California: 1950-1961.*
4. Joseph Velikonja (Southern Illinois Univ.) – *The Italian-Born in the United States, 1950.*
5. James F. Woodruff (Univ. of Georgia) – *A Study of the Characteristics of the Alabama Slave Population in 1850.*
6. Wilbur Zelinsky (Southern Illinois Univ.) – *Geographic Patterns of Change in the Rural Population of the United States, 1790 - 1960.*

B. CARTOGRAPHY, Auditorium
J. Ross Mackay (Univ. of British Columbia), Presiding

1. Richard E. Dahlberg (Univ. of California, Los Angeles) – *Evolution of Interrupted Projections.*
2. John E. Dornbach (USAF Aeronautical Chart and Information Center) – *Charting for Project Mercury.*
3. John Hopkins (USAF Aeronautical Chart and Information Center) – *Statistical Evaluation of Relief Data Portrayed on the Aeronautical Chart.*
4. Toshio Hoshide (Army May Service) – *The New National Land Base Maps of Japan.*
5. Manuela G. Kogutowicz – *The Importance of National Atlases.*
6. A. Philip Muntz (The National Archives) – *Union Mapping Activities in the Civil War.*
7. Waldo R. Tobler (Univ. of Michigan) – *Implications of Recent Innovations in Cartography.*

C. EUROPE AND THE U.S.S.R., Room 106
John A. Morrison (Univ. of Pittsburgh), Presiding

1. John Q. Adams (Army Map Service) – *Building Types in Western and Southern U.S.S.R., Similarities and Contrasts.*
2. Ferencz P. Kallay (Valparaiso Univ.) – *The Oristanese Project: An Effective Attack Upon an Old Problem.*
3. Richard E. Lonsdale (Harpur College) – *Industrial Location Planning in the Soviet Union.*
4. Robert D. Picker (Wisconsin State College, Whitewater) – *Market Characteristics and the Growth of Production in the Kuznetsk Coal Basin of the Soviet Union.*
5. H.B. Rodgers (Univ. of Manchester) – *The Lancashire Cotton Industry 1920-1960: The Geography of Decline and Reconstruction.*
6. Kirk H. Stone (Univ. of Wisconsin) – *Finnish Fringes of Settlement.*

12:00 noon
SPECIAL LUNCHEONS
University of Chicago

1:30 - 3:30 p.m. (Three Concurrent Sessions)

A. URBAN MIDWEST, Auditorium
John F. Lounsbury (Eastern Michigan Univ.), Presiding

1. John R. Borchert (Univ. of Minnesota) – *The Growth of Small and Medium-Sized Cities in Minnesota and Western Wisconsin.*
2. Martha Church (Wellesley College) – *Functional Duplication and Diversity in a Twin Cities Area: Benton Harbor and St. Joseph, Michigan.*
3. Eugene C. Kirchherr (Western Michigan Univ.) and William A. Ripatte (Planning Director, Kalamazoo) – *The Burdick Mall of Kalamazoo: A Study in CBD Redevelopment.*
4. Howard A. Stafford, Jr. (Southern Illinois Univ.) – *An Evaluation of Selected Factors Influencing Grocery Store Locations: Des Moines, Iowa, 1958.*
5. Edward J. Taaffe and Barry J. Garner (Northwestern Univ.) – *The Peripheral Journey-to-Work: A Simulation Approach.*

B. ECONOMIC - AGRICULTURE, Lincoln Room
....., Presiding

1. Leverett P. Hoag (Univ. of Minnesota, Duluth) – *Causal Factors for Cash-Grain Farming Areas in the Corn Belt: A Study of Intellectual Laxity.*
2. John L. Taylor (Consultant on Territorial Affairs, U.S. House of Representatives) – *Making a Living in American Samoa.*
3. Benjamin E. Thomas and John B. Whittow (Univ. of California, Los Angeles) – *Climate and Economic Activity in the Somali Country.*

C. HISTORICAL - ECONOMIC GROWTH, Room 106
....., Presiding

1. Stephen S. Visher (Indiana Univ.) – *The AAG in Its Early Years.*
2. Walter W. Ristow (Library of Congress) – *John Melish, Geographer and Map Publisher.*
3. Thomas R. Smith (Univ. of Kansas) – *Geographic Change and Location-Type Areas in the Blast Furnace Industry of the United States, 1901-1960.*
4. Morgan D. Thomas (Univ. of Washington) – *Imports, Industrialization and the Economic Growth and Development of Lesser Developed Countries.*

4:00 - 5:30 p.m.
COMMITTEE MEETINGS

7:00 p.m.
ANNUAL BANQUET, Big Ten Room
Address by Honorary President, C. Warren Thornthwaite

FRIDAY, SEPTEMBER 1, 1961

8:00 a.m. - 5:00 p.m.
LANDSCAPE IN LOWER MICHIGAN, FIELD TRIP – Dieter Brunnschweiler, leader

9:00 a.m. - 12:00 noon
OLDSMOBILE FIELD TRIP (tentative)

OTHER EVENTS

FIELD TRIPS FOR WOMEN AND CHILDREN
9:00 a.m. - 4:00 p.m., Tuesday, August 29, 1961 – Henry Ford Greenfield Village, Dearborn, Michigan.
9:00 a.m. - 4:00 p.m., Wednesday, August 30, 1961 – Northland Shopping Center, Detroit, Michigan.

1960-1961 AAG COUNCIL MEETING
Monday, August 28, 1961

1961-1962 AAG COUNCIL MEETING
Friday, September 1, 1961, 8:00 a.m.

Eugene Cotton Mather, Chairman
Program Committee

University of Minnesota

HOUSING ACCOMMODATIONS AT EAST LANSING

	TOTAL ROOMS OR UNITS	ONE PERSON	TWO PERSONS	EXTRA PER PERSON
Campus				
Kellogg Center (Hdqrs.) (1)				
Conference rates	150	8.00	9.00	.....
Dormitory				
Conference rates only	unlimited	4.50 1st day 3.00 per day thereafter	.....	3.00 1st day 2.00 per day thereafter
Vicinity of East Lansing				
(1 to 2 miles from Hdqrs.)				
Albert Pick Motor Hotel (1, 2)				
1427 West Saginaw, E. Lansing	107	7.50 - 10.00	10.50 - 11.00	2.00 - 2.50
Amity Hall Motel (1)				
2722 E. Grand River, E. Lansing	40	8.00	9.00 - 10.00	1.00 - 1.50
Holiday Inn (1, 2)				
3121 E. Grand River, Lansing	108	7.50 - 11.00	9.50 - 11.00	2.00
Poplars Inn Motel (1, 2)				
2726 E. Grand River, E. Lansing	82	8.50	12.50 - 13.50	2.00
Lansing – City Center				
(3 miles from Hdqrs.)				
Capital Park Motor Hotel (1,2)				
501 Townsend, Lansing				
Hotel rooms	130	5.50 - 7.00	8.50 - 9.50	.....
Motel units	147	8.50	11.00 - 12.00	.....
Jack Tar Hotel (1)				
Michigan and Capitol Ave.,				

Lansing	350	5.75 - 10.00	8.00 - 15.00	2.50
Riverside Manor Motel (1)				
112 E. Main St., Lansing	144	8.00	10.50 - 13.00	2.00
Suburban				
(4 to 8 miles from Hdqrs.)				
Motel Burkewood (1)				
3210 W. Main St.,				
Lansing	31	6.50 - 7.50	8.00 - 10.00	2.00 - 3.00
D and O Motel				
2221 N. Cedar St., Holt	10	6.00	6.50 - 10.00	1.50 - 2.00
Green Acres Motel				
U.S. 27, 4 miles N. of				
Lansing	19	.....	7.00 - 12.00	2.00
Rancho Motel				
15749 North East St.,				
Lansing	10	.....	8.00 - 10.00	2.00
Westhaven Motel (1)				
5250 N. Grand River,				
Lansing	12	5.50 - 7.50	6.50 - 8.50	1.00 - 2.00
West View Motel				
15713 North East St.,				
Lansing	12	.....	7.00 - 10.00	2.00
Winslow's Family Motel (1)				
	15	5.00 - 8.00	6.00 - 11.00	1.00 - 2.00

(1) Air conditioned. (2) Swimming pool. Add 4 per cent State Use Tax to all rates.
With the exception of the Capital Park Motor Hotel, all of the above establishments are listed in the Great Lakes Tour Book of the American Automobile Association and are recommended by the AAA. Most of these establishments allow pets or will work out individual arrangements for guests' pets.
Housing other than on Michigan State Campus must be reserved directly with hotel or motel.

TRANSPORTATION COSTS TO EAST LANSING

ROUND TRIP, TAX NOT INCLUDED (1)

	AIRLINES (2)		RAIL COACH	BUS
From	*Air Tourist*	*Air 1st Class*		
Atlanta	90.70	102.90	54.75	40.25
	(85.30 night)			
Boston	98.20	109.60	67.95	49.50
Chicago	.....	35.09	18.30	14.40
Cincinnati	.....	59.10	18.50	19.90
Dallas	125.10	148.20	64.75	48.25
Denver	127.60	159.90	68.80	58.50
Miami	148.50	192.50	93.60	71.20
	(133.20 night)			
Minneapolis	51.20 (3)	66.00	37.65	28.80
Montreal	64.00 (3)	96.00	44.95	34.95
New Orleans	128.90	153.60	63.30	49.00
	(118.80 night)			
New York	78.20	85.00	58.60	43.75
Philadelphia	73.90	80.20	.....	39.25
St. Louis	.....	63.40	31.20	26.20
Washington, D.C.	69.00	76.90	39.20	38.70
West Coast	218.50	280.70	121.80	111.70 (4)

(1) The above fares were quoted by the transportation companies on April 24, 1961. No change of fare is anticipated before the AAG Meetings at East Lansing, August 27 - September 1, 1961.
(2) Air travel jet surcharge varies, but maximum does not exceed $10.00 each way. Limousine from Lansing airport to Kellogg Center, East Lansing, $1.75 each way, is not included in air fares. Cost of transfer between airports in Detroit or Chicago is not included.
(3) Fare to Detroit; add transfer by bus to center of Detroit and bus to East Lansing.
(4) Los Angeles only.

ANNOUNCEMENTS AND REPORTS

TRAVEL STUDY AND GEOGRAPHY FIELD TRIPS IN EUROPE

Within the past several years, there has been a considerable increase in the number of American collegiate campuses of a more or less permanent nature in various European cultural centers. Despite criticisms of the calibre of students selected for such ventures abroad, and of the quality of various course offerings, most programs have achieved at least some degree of success.

So far, however, little attention has been given to the teaching of the natural and physical sciences to American students in the European environment, for a successful experience of this kind overseas necessarily involves careful planning in the presentation of laboratory and field work problems. This report presents details concerning one such pioneering course, a unique program of geographical study and travel in Europe conducted during the academic year 1959-60 by the Chico (California) State College. Western Europe, with its small area and geographical compartmentalization, is particularly well adapted to the effective planning of short field trips involving the intensive study of minute features of cultural and physical landscapes.

The 50 students enrolled in the course were required to take a 33 semester hour course load over two semesters. Instead of the usual single campus location, eight study centers were selected: Amsterdam, Bad Voslau (Vienna), Florence, Rome, Barcelona, Madrid, Paris, and London. Among other subjects, each student was required to take three courses in geography for a total of nine credit hours. These courses extended over the entire year and were taught in two sections of 25 students each. Improvised classroom and study facilities were available, and regular academic credit was granted by the college through the state board of education. Standards of evaluation were comparable to those on the regular campus, and approximately the same number of hours of instruction and examination per unit credit were achieved.

Courses in the geography of western and southern Europe, the Mediterranean Basin, and political geography were chosen. Because of budget limitations, textbooks and maps were purchased in London before the group arrived on the continent. In each instructional center, the course content corresponded as closely as possible to the local setting.

The first two weeks of residence were in Amsterdam, and daily lectures were conducted in the public rooms of the *pension*. Course materials included an introduction to the physical and cultural geography of Europe and to regionalism. Study was concentrated, of course, on the Netherlands, particularly metropolitan Amsterdam and the North Holland agricultural region. Two field trips, each a full day in length, were conducted for each of the student groups. Only three of the seven Volkswagen Microbuses belonging to the group were used for field trip transportation as the instructor felt that a smaller number of cars could more easily cover the planned itinerary within the limits of daylight hours. The maneuverability of the Volkswagens made it possible to visit otherwise inaccessible areas.

Development of the regional unit was of primary concern in the preparation of each field trip. The students gained some knowledge of the various regional problems by using such tools as maps, charts, and statistics obtained locally. Each student was provided with appropriate functional maps prior to the days of departure so that the itinerary could be more easily followed and local features more easily identified. At each chief point of interest, the group assembled for a brief description followed by closer inspection of the geographic phenomena.

The North Holland field trip (Fig. 1) was organized on the following pattern. First, an early morning overview of the various aspects of urban and port development of Amsterdam was presented to the students. Next, a drive along the North Sea Canal enabled the student to observe various types and origins of shipping moving between the North Sea and Amster-

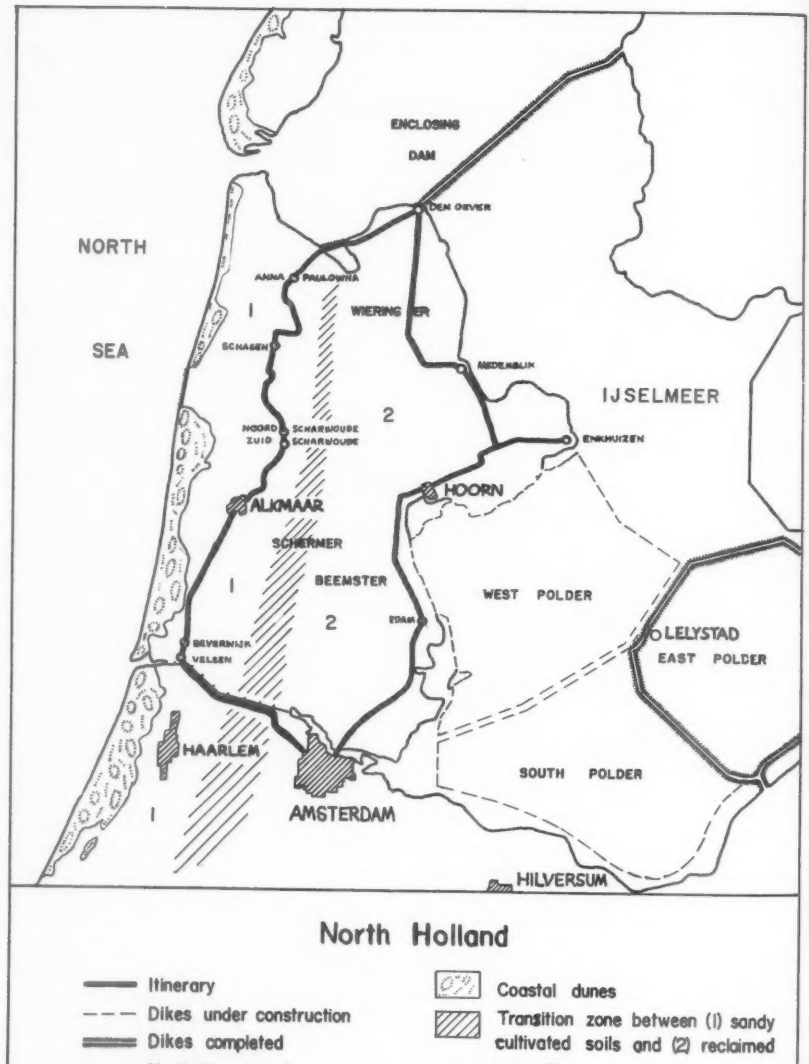


FIG. 1

dam. The Netherland's largest steel plant at Velsen was reached via the new auto tunnel under the Canal. Enroute to Alkmaar and the cheese market, the transition from industrial to agricultural land use was noted. Also, contrasting soil types

were evident, including the little utilized dune coastal lands and the sandy cultivated soils farther inland around Alkmaar. A third soil group, based on reclaimed sea silt, was evident later during the return part of the trip (Fig. 1).

Alkmaar and Schagen offered interesting diversity to the student, the former being a cheese marketing and wholesale center whereas the latter is devoted to the marketing and slaughtering of beef cattle. The agricultural village of Anna Paulowna offered a contrast, with fields producing high yields of wheat, sugar beets, and potatoes.

Den Oever, at the entrance to the highway over the Ijselmeer Enclosing Dam, was reached at noon. Returning southward toward Amsterdam, the students observed the reclaimed Wieringer Polder which had been flooded by the Germans in an attempt to deter invasion in the winter of 1944-45. Near Medemblik, the students were conducted through the Lely pumping station which disposes of much of the excess waters of the Wieringer Polder into the Ijselmeer. Both at Medemblik and Enkhuizen, fishing activities were observed as the catches were brought in at the day's end. The remainder of the return route was selected along the North Holland Canal through the older Beemster Polder.

Enroute to our next "campus," near Vienna at Bad Voslau, the itinerary followed the Rhine Gorge and Graben, the Bavarian Uplands, and Upper and Lower Austria. Unlike the extensive North Holland field trips, with their emphasis on rural land use and reclamation practices, the Austrian trips were shorter (75-100 miles per day) and were essentially concerned with problems of political geography in the Austro-Hungarian border lands.

The primary focus of the Austrian trips was the border zone in south-central Burgenland, between the Austrian village of Lockenhaus and the Hungarian town of Koszeg (Guns). This particular frontier region was chosen as it was then relatively obscure and traffic across the border was negligible, which facilitated field work by a large group. Moreover, it was quite close to several Croatian agricultural villages in east-central Burgenland. The Burgenland-Hungarian border, a line of political separation within a natural region, was dramatized by a freshly plowed strip about 50 feet wide planted with land mines and dominated by watch towers and barbed wire. Other field trips in Austria were concerned with the effect of the Austro-Czech border upon Danubian shipping near Bratislava.

Next, the students travelled through the Austrian and Swiss Alpine regions before descending into the Po Plain of Northern Italy and on to Florence, the third "campus." The field area here was the valley of the Arno extending from Florence to the sea near Pisa and Livorno, a triangle backed by the Apennines which offered the students an excellent example of the contrasting physical and cultural features of Tuscany. Following an intensive study of Tuscany, the industrial growth of Rome and Naples was highlighted with visits to slum clearance projects and new factory construction. A short excursion south of Salerno into the Sele River valley was included to view the results of the land reform program.

The Spanish experience was quite unlike anything that the students had yet encountered. Barcelona and Madrid were the chief centers studied, and offered a considerable array of materials for analysis. One field trip combined a study of the industrial suburb of Barcelona, nearby Badalona, and the north coastal huertas and vegas. Another, longer, week-end journey followed the valley of the Llobregat into the interior depressions and dissected plateau regions adjacent to the Pyrenees.

From Spain, the destination was Paris via the Atlantic Coastal Plain with side trips into the Dordogne and Loire valleys. The foci of geographic study at the last two "campuses," Paris and London, were commerce and industry. A highlight was a visit to the steel rolling mill of the English Steel Corporation in Sheffield.

In summary, the travel-study geography field trips in the Chico-sponsored experiment proved to be a successful adjunct to classroom work in a Europe regional geography course. Generally, a high degree of motivation was achieved, by means of rather detailed preparations beforehand. The ideal situation, however, would have involved the training of a smaller group of geography majors so that more time could be devoted to field problems. This could only be achieved if most of the course load were allocated to geography.

J. S. Haupert
Sacramento State College

NEWS FROM GEOGRAPHIC CENTERS

ALBERTA, UNIVERSITY OF

The Department has experienced major growth in staff and in the inauguration of a graduate program this past year. Dr. Robert Common, formerly Associate Professor in the Department, returned to the United Kingdom to accept a post with the Queen's University, Belfast. Bryan H. Farrell, formerly Senior Lecturer in Geography at the University of New Zealand, Auckland, joined the Department as Associate Professor. Dr. Farrell specializes in economic geography, history of geographic thought, and the Southwest Pacific. He recently spent a year on field research in American Samoa on an ONR grant.

Other appointments since the previous report was made in May, 1959, include John F. Bergmann, Richmond W. Longley, J. Gordon Nelson, Peter J. Smith, and Bruce S. Young. Dr. Bergmann previously was Assistant Professor at Southern Methodist University, Dallas, and is a specialist in Latin America and historical geography. He participated in a round table discussion at the University of Florida's Conference on the Caribbean in December, 1960, and will be continuing field research in Central America on a University grant during the summer of 1961.

Professor Longley is a recognized authority on meteorology and climatology and is developing these fields at the University. Prior to joining the Department he was with the Meteorological Service of Canada for many years, and held the position of Arctic Climatologist at the time of his appointment. He currently is conducting research into hail for the Research Council of Alberta and for the Meteorological Service.

Dr. Nelson specializes in geomorphology and in cultural geography. He previously was a post-doctoral fellow in geography at Johns Hopkins University. At Alberta, Dr. Nelson is in charge of the expanding geography program now being offered on the Calgary campus, and is currently completing a report on physiographic studies on the Susquehanna River area for the National Science Foundation.

Professor Smith is a qualified professional planner as well as a geographer, and was formerly Research Planner with the City of Calgary. His specialties are in human geography, and town and regional planning. He spent the summer of 1960 in New Zealand visiting various planning centers. During the academic year he instituted a new course, Geography and Planning, in which members of the planning staffs of the three levels of government (Provincial, district, city) registered as well as regular university students.

Professor Young was formerly Lecturer in Geography at the University of Natal, Pietermaritzburg, and specializes in cartography, Europe, and Africa. During the summer of 1961 he will be Visiting Professor at the University of Minnesota, and will later be engaged in land use studies in Malta.

Both Arleigh H. Laycock and William C. Wonders, Departmental Chairman, participated in international congresses in Europe during the summer of 1960. Dr. Laycock read a paper, Drought Patterns in the Canadian Prairies, at the International Union of Geodesy and Geophysics in Helsinki, and also attended the IGU congress in Stockholm. During the academic year he offered a new graduate course on Air Photo Interpretation. His main study of Water Surplus and Deficiency Patterns in the Prairie Provinces, for the Prairie Provinces Water Board, is scheduled to be completed during the summer of 1961.

Dr. Wonders spent four months in Scandinavia during the summer of 1960. He was named Chairman of the Directorate of The Boreal Institute, the new northern institute established at the University in 1960, and received a Canada Council grant enabling him to visit similar institutes in Scandinavia and Britain. He read a paper, Postwar Settlement Trends in the Mackenzie Valley Area, at the IGU congress in Stockholm. During the Spring of 1961 he was an observer on the annual RCAF resupply of the Joint Arctic Weather Stations, and delivered the keynote address, The Potential of Regional Planning, at the Regional Planning Conference of the Community Planning Association of Canada in Toronto.

Frederick W. Boal has been appointed Assistant Professor of Geography and will join Dr. Nelson on the Calgary campus in September, 1961. Boal is an honors graduate from Queen's University, Belfast, and is completing his doctorate at the University of Michigan, from which University he holds the M.S. in Conservation.

Several of the staff attended the annual conference of the Canadian Association of Geographers in Montreal in June, as executive members or to present papers. These included Bergmann, Laycock (Dry Farming as a Means of Water Conservation), Nelson (The Problem of Pre-European Trade Between Australia, Indonesia and the Asiatic Mainland), Wonders, and Young.

A graduate program at the master's degree level was begun in the Department in 1960-61. Six graduate students were in residence. Three of these held their first degrees from Alberta – A.M. Baker, Miss G.L. Powell, and T.F. Saarinen; and three came from other universities – Miss M.E. Crawford (Queen's, Belfast), U. Masing (Clark), and H.A. Rendall (Toronto). The first graduate degree in geography at the University of Alberta was the M.Sc. awarded Miss Powell (thesis: The Relationship of Physiography to Hail in Alberta) at the May, 1961 convocation. In addition to those returning, new graduate assistants appointed for 1961-62 are L.S. Bourne (Western Ontario, London), D.B. Johnson (British Columbia), T.R. Lee (London School of Economics), H.J. McPherson (Queen's, Belfast), S. Raby (Oxford).

AUCKLAND, UNIVERSITY OF

Professor H.M. Mayer of the University of Chicago is spending the 1961 academic year as Fulbright Professor at the Department of Geography, University of Auckland, New Zealand. In addition to offering a graduate seminar on urban geography and an undergraduate North America course, Professor Mayer has undertaken a number of engagements to lecture elsewhere in New Zealand and in Australia. Professor Josef Schmithusen, Director of the Institute of Geography, Technische Hochschule, Karlsruhe, Germany, will be Visiting Lecturer in the Department during 1962.

A number of faculty changes have taken place recently in the Department. Dr. B. H. Farrell has accepted an associate professorship at the University of Alberta, Edmonton and left Auckland in December, 1960 to take up the new position. Mr. R.G. Ward accepted a position as Lecturer in Geography at University College, London. Dr. Marion Ward resigned to accompany her husband. Mr. M. Chapman, Junior Lecturer last year, accepted a position as Research Assistant, School of Social Science, Victoria University, Wellington.

Several new appointments have been made. Dr. J.B. Dalrymple, formerly of Wye Agricultural College, England, has joined the Department as Lecturer. His special interests are in the fields of pedology and geomorphology. Miss A.M. Gorrie, formerly of Auckland Teachers' Training College, also has joined the Department as Lecturer. Her major interest is in the history and nature of geography. Mr. P.D. Keddie, from the Universities of Manitoba and Wisconsin, joined the Department as Lecturer at the Waikato Branch. Mr. J.S. Whitelaw was appointed Junior Lecturer; and Mr. R.D. Hill and Mr. R.F. McLean are with the Department on one-year appointments as Junior Lecturers. In addition, Mr. A.S. Fraser has been appointed Lecturer commencing mid-year 1961. He was formerly Lecturer in geography at the University of Aberdeen, and is a specialist in biogeography. Mr. J.G. Fielding, whose special interests are in the field of agricultural geography, has been appointed Lecturer commencing February, 1962. Meanwhile, he is completing doctoral work at UCLA and has a one-semester appointment at Dartmouth College, N.H.

The Department's research on Samoan agriculture, resources, and population was completed last year and will be published shortly as a monograph entitled *Land, Life and Agriculture in Western Samoa.* This research project, conducted over the past few years, was made possible by a grant from the University of New Zealand's Carnegie Social Science Research Grants Committee.

CALIFORNIA, UNIVERSITY OF, BERKELEY

The Geography Department has completed its move to the top floor of the new, five-story Earth Sciences Building, which it will share with geology and paleontology.

From the new quarters there is an unobstructed view of the Bay Area, from the north of Mount Tamalpais to the Santa Cruz Mountains.

Robert E. Dickinson, of the University of Leeds, has been Visiting Professor during the past year. David H. Miller, of the U.S. Forest and Range Experiment Station, has been offering a graduate seminar in hydrology; and John Leighly has been called back from retirement to give courses in meteorology and climatology. James J. Parsons has replaced Professor Leighly as departmental Chairman.

Staff appointments for the 1961-62 academic year include the following: Hans G. Gierloff-Emden, University of Hamburg, Visiting Assistant Professor for the Fall semester; Leszek Kosinski, Polish Institute of Geography, Warsaw, Visiting Lecturer for the Spring semester; David I. Blumenstock, Pacific Area Climatologist, U.S. Weather Bureau, Visiting Lecturer for the year. During the Spring semester, Daniel B. Luten, research chemist with Shell Development Co., will offer a course on Energy Resources; and Professor Emeritus Carl O. Sauer will conduct a seminar on Plant and Animal Origins and Dispersals.

Paul Wheatley has been Acting Director of the University's Southeast Asia Institute during the past year. James E. Vance, Jr., has spent the past year in England on a Social Science Research Council grant. University of California Publications in Geography in press include monographs by Marvin Mikesell on *The Northern Zone of Morocco* and William Denevan on *The Pine Uplands of Nicaragua*. The 1961 Summer Sessions staff is composed of Frank Ahnert, Maryland; Homer Aschmann, University of California at Riverside; and Marvin Mikesell, Chicago.

CHICAGO, UNIVERSITY OF

Shimzo Kiuchi, Tokyo University, has been appointed as Visiting Professor on the Inter-University Scholars program for 1961-62. W. Vaughan Lewis, of Trinity College, Cambridge University, served as Visiting Professor during the Spring Quarter, 1961, and offered a seminar in geomorphology.

The Department has offered a course in the University's Downtown Center for teachers who are interested in applying newer concepts from geographic research to geography in high schools.

Robert S. Platt has received a Fulbright grant to carry on research in East Pakistan, centered in Dacca, for an eight-month period beginning in September, 1961. Wolf Roder is in Southern Rhodesia on a Ford Foreign Area Training Fellowship to investigate the impacts of small-scale irrigation projects. Gilbert F. White served as a visitor at the University College of Rhodesia and Nyasaland during March, 1961, to work on problems of water resource appraisal. Effective July 1, 1961, Wesley C. Calef will become Chairman of the Department.

JOHNS HOPKINS UNIVERSITY

Charles B. Hunt of the U.S. Geological Survey has joined the Isaiah Bowman Department of Geography at The Johns Hopkins University as Professor of Physical Geography. Professor Hunt is presently completing a study of the geology and geography of Death Valley for the Geological Survey which will include the structural history, ecology, and hydrology of the area. Mrs. Hunt recently completed a study of the archeology of the region.

David F. Bramhall has joined the staff as an Assistant Professor, having completed his dissertation in regional science at the University of Pennsylvania on Integrated Techniques for Regional Projection and Policy Formation.

In addition to the above, the staff of the Department now includes Professors George F. Carter and George S. Benton, and Associate Professors John C. Goodlett and M. Gordon Wolman, the latter being Chairman of the Department.

LOUISIANA STATE UNIVERSITY

At LSU, geography, in combination with anthropology, is a Department within the School of Geology. The close affiliation that exists between these disciplines is reflected in overlapping course offerings and in the nature of the research conducted and supervised by the faculty.

During the past several years the Department has experienced continuous growth, the greatest of which has been in the graduate program. In the Fall of 1961, 37 students were working for advanced de-

grees, a number nearly double that of 1957. Although the first doctorate was awarded in 1938, it was not until after World War II that graduate work became of major concern. With the granting of five Ph.D. degrees in 1960, the Department total was brought to 20, of which five have been awarded to foreign students.

Students and staff alike have enjoyed and benefitted from recent visits by several well known geographers. C.O. Sauer conducted a seminar on early man during the Spring of 1960. He also contributed a lecture on Man as a Geographic Factor to the series in humanities offered annually by the University. In the same series, W.R. Mead, of the University College, London, discussed The Historical Geography of Finland.

Other visitors to the Department have included O.H.K. Spate, Australia, who spoke on cultural changes in Australia; Ake Sundborg, Sweden, who gave a report on recent developments in alluvial morphology in Norden; Clifford Darby, London; Jogyo Takeuchi, Japan; Josip Roglic, Yugoslavia; Aroldo de Ozevedo, Brazil; and Antoni Kuklinski, Poland.

The activities of individual staff members have been quite varied during the past few years. R.J. Russell, besides offering a course in alluvial morphology, is Acting Dean of the Graduate School and Director of the Coastal Studies Institute. He serves on numerous elective and appointive committees, panels, and councils, including some advisory to such governmental bodies as the House of Representatives, the DOD, and NRC. Dr. Russell has recently had several articles published, mostly dealing with beach rock. In addition, a new, brief edition of *Culture Worlds*, in collaboration with F.B. Kniffen and Evelyn Pruitt, has been printed.

On April 24, Dr. Russell was presented the 1961 Vega Medal, the most prominent award conferred by the Swedish geographic profession. The medal was awarded by the Queen of Sweden in Stockholm "for prominent geomorphological researches, especially concerning river-deltas and coasts." Dr. Russell became the fifth American to receive the medal since it was first awarded in 1881, joining W.M. Davis, R. Byrd, R. Chapman Andrews, and C.O. Sauer. Dr. Russell's immediate future includes field work on beach rock in the Pacific this summer; the chairmanship and editorship of papers for the symposium, Pacific Island Terraces: Eustatic?; and participation in the INQUA meetings in Poland.

F.B. Kniffen, Department Head, is awaiting next year's sabbatical leave during which he will devote his time to a study of the Original Settlement Patterns of the Eastern United States under the sponsorship of the NSF. Besides preparing for this study, Dr. Kniffen is continuing his investigations of the archeology of several Louisiana parishes. Recent articles by him have appeared in *Landscape* and *Louisiana History*. Dr. Kniffen is a member of several committees with the NRC, NSF, and AAG. In the latter organization he serves as Chairman of the Publications Committee.

R.C. West, on leave during the 1960 academic year, has been concentrating on the completion of a textbook on the *Geography of Middle America*, and on the editing and writing of two articles for Vol. II, The Natural Environment, of the forthcoming *Handbook of Middle American Indians*. He is a member of the NRC Committee advisory to the ONR and the NSF selective panel. Recent articles by him have appeared in *Actas del XXXIII, Congreso Internacional de Americanistas*, and the *American Anthropologist*.

W.G. Haag will return to the Department in June when he completes nine months of archeological field work in Martinique and adjacent islands under an NSF grant. His study is concerned with determination of the cultural dynamics of early peoples of the islands. He is editor of the *Southeastern Archeological Newsletter*, and has recently had published his *Archeology of Coastal North Carolina*. His teaching duties this year have been assumed by Malcomb Webb from the University of Michigan.

W.G. McIntire is devoting the year to the completion of several reports for the Coastal Studies Institute on various aspects of the coastal morphology of New England and Mauritius. Recent published articles and reports have dealt with the Bengal Basin and the Mississippi Delta. In the summer of 1961, he will work in the Pacific with Dr. Russell and, while there, will present a paper at the Pacific Science Congress.

J.H. Vann, also on leave, is continuing his coastal investigations in northeastern South America under ONR sponsorship.

His findings have recently been presented at various scientific meetings, including the IGC, and have appeared in several published and unpublished reports.

H.J. Walker joined the staff in 1960 after a year with the Geography Branch of the ONR. He presented a paper in Stockholm based on research conducted in Mauritius with W.G. McIntire and Jonathan Sauer. This summer, he will begin a field study of the Colville Delta in Arctic Alaska.

Several graduate students also are actively engaged in foreign field research, including Robert Andrle, eastern Mexico; Layton Miller, Martinique; Morris Morgan, the Arctic; Rodman Snead, West Pakistan; Peter Wacker, Brazil; and Eugene Wilhelm, Patagonia. In addition, other graduate students are investigating a variety of subjects, both physical and cultural, in different parts of the United States, especially Louisiana.

PORTLAND STATE COLLEGE

Geography has attained departmental status this year as the enrollment and staff continue to grow. Two members were added this year: James Haratani, a Ph.D. candidate at the University of California, who recently returned from 16 months in India and East Pakistan where he was conducting field work for his dissertation; and Dale Stradling, who is a doctoral candidate at the University of Nebraska.

The Department will lose its first member next fall when James Brooks leaves to assume the Presidency of Central Washington State College. At 35, he is the youngest man in the history of the College to hold that position.

Clarke Brooke has been spending the year in Tanganyika studying acute food shortages under a National Science Foundation grant. He is now in London, where he will complete his research. He will return to Portland to teach in the summer session.

Dale Courtney, after spending last summer doing field work on the west coast of Mexico, will reside this summer in Portland and work with the Portland school system to develop a new secondary social studies curriculum.

Howard Martin, University of Washington, and Chester Cole, Fresno State, will be Visiting Professors this summer, joining Clarke Brooke and Wayne Heiser on the Portland State campus. In addition, John Dart and James Ashbaugh will teach field courses in conservation in selected areas of the Cascades.

OTHER ITEMS

MANUSCRIPT AWARDS: INSTITUTE OF EARLY AMERICAN HISTORY AND CULTURE

Of possible interest to historical geographers is announcement of an invitation for entries for two manuscript awards by the Institute of Early American History and Culture.

The Institute Manuscript Award of $1,000, with assurance of publication, will be granted for the best unpublished work in any phase of American history dealing with the period from ca. 1760 to ca. 1815. Deadline for receipt of manuscript for the 1961 award is December 1, 1961. The winner will be announced in May, 1962.

The Jamestown Foundation Award of $1,000, with assurance of publication, will be granted for the best unpublished work in any phase of American history dealing with the period from discovery to ca. 1760. Deadline for receipt of manuscript for the 1962 award is December 1, 1962. The winner will be announced in May, 1963.

There are no special entry forms for either award. Manuscripts should be addressed to the Editor of Publications, Institute of Early American History and Culture, Box 1298, Williamsburg, Virginia. The award manuscripts will be published for the Institute by The University of North Carolina Press.

NEW PUBLICATION

The first issue (January-March, 1961) of *Migration*, Quarterly Review of the Intergovernmental Committee for European Migration, initiates publication of a magazine which should be of interest to geographers.

Articles appearing in this issue include: The Influence of Migration on Australian Foreign Policy; Prospects and Machinery of European Migration Movements Within the European Economic Community; The Importance of Immigration in the Development of Brazil; and Emigration from Greece. Additional notes on population matters in general also are contained in the volume.

Information concerning the publication may be obtained from: Marcus Daly, Director of the Intergovernmental Committee for European Migration, 63, rue des Paquis, Geneva, Switzerland.

AAAS MEETING, DENVER, DECEMBER, 1961

The national meeting of the American Association for the Advancement of Science will be held in Denver, December 26-31, at the Denver Hilton and Brown Palace Hotels.

Several interdisciplinary symposia that are scheduled in the physical, biological, and social sciences will be of keen interest to geographers. Of special interest is the symposium cosponsored by Section E, the Geology and Geography section of the AAAS, on Land and Water Resources. Several geographers are participating in this presentation.

Geographers may wish to present current research information at these meetings. They are urged and invited to do so and must express their desire to present papers as soon as possible. Abstracts of the papers presented in Denver must be submitted before September 15 and must be less than 250 words in length. All abstracts will be published by the Geological Society of America and possibly by the AAG.

Additional information and details about the Denver meeting will appear in forthcoming issues of *The Professional Geographer*. Address all correspondence concerning geography papers to the Program Chairman, Section E, AAG, M. John Loeffler, Department of Geography, Guggenheim 102B, The University of Colorado, Boulder, Colorado.

SOUTHEAST ASIA CONFERENCE

The Regional Conference of Southeast Asian Geographers will be held in Malaya and Singapore during April, 1962. The conference is being sponsored by the International Geographical Union and the University of Malaya, and will focus attention on geographical themes of immediate relevance to Malaya and Southeast Asia, thereby providing data for assessing past practices and future policies in the region and in the humid tropics generally. It will also bring together geographers and other specialists interested in the region to stimulate research and to promote the communication of information.

Sessions will be held in Kuala Lumpur and Singapore, at which papers will be presented and discussions held on some of the following themes: rural development; agricultural potentials; settlement patterns and planning; mineral and power resources; industrialization; population movements; economic facilities; cultural and religious backgrounds; cartography; teaching of geography; and physical and regional studies. Papers on these themes are invited. All papers will be reproduced in typescript for circulation at the conference if received before March 15, 1962, and will be published in a special number of *The Journal of Tropical Geography* after the conference.

An exhibition of Malayan and Southeast Asian maps will be held in Kuala Lumpur. There will also be a display of books and publications relating to the region. Short visits will be arranged during the conference to, among others, the Federation of Malaya Departments of Agriculture, Survey, Town Planning, Drainage and Irrigation, Ministry of Rural Development, and Forest and Rubber Research Institutes. Visits to selected farms, tin mines, settlements, rubber estates, vegetation climaxes, and physical regions also are planned.

After the conference, a 10 to 14 day tour of Malaya will show overseas delegates the principal regions and activities of the country. The tour will involve over 1,000 miles by coach, airplane, and boat. The cost per person is unlikely to exceed Malayan $600.

Accommodation in the University of Malaya Halls of Residence will be available at a cost of about M$7.50 per person per day inclusive of meals. Hotels in Kuala Lumpur and Singapore are available at M$12 to $40 per day.

A registration fee of M$25 is required from overseas delegates attending the con-

ference. This will cover the cost of all publications and the right to participate in any of two of the local visits. Local delegates will be registered for M$10, entitling them to attend all sessions and to receive all publications.

Please write for further details to: Professor Robert Ho, Department of Geography, University of Malaya, Kuala Lumpur, Malaya.

SOCIETY FOR THE HISTORY OF DISCOVERIES

The Society for the History of Discoveries was established last year in a most informal manner when it was proposed by a number of American historians meeting more or less by chance at the International Congress of the History of the Discoveries at Lisbon in September (see *The Professional Geographer*, Jan., 1961, p. 30). The Society was officially launched at a luncheon meeting held during the annual meeting of the American Historical Association in New York last December, at which time Thomas Goldstein, Department of History, City College of New York was named president and John Parker, James Ford Bell Collection, University of Minnesota Library was designated secretary.

The Society hopes to function in at least three important ways: (1) as a clearing house for the interchange and publication of information on the history of discoveries and such scholarship as is being carried on in that general field; (2) the stimulation of public interest in the subject; and (3) the encouragement of scholarly achievement. In the furtherance of these objectives, the first *Annual Newsletter* has been issued; it is hoped that in time it may develop into a full-fledged scholarly journal. Geographers interested in receiving the *Newsletter* and in joining the Society should communicate with Mr. Parker.

INDEX MAP OF AERIAL PHOTOGRAPHY

The 1961 edition of the index map, *Status of Aerial Photography*, is now available for distribution. This index presents an inventory of areas of the United States known to have been photographed by or for Federal, State, and commercial agencies.

For those areas photographed more than once for special purposes, the coverage considered most suitable for average needs is shown as primary photography. The agencies from which reproductions of this photography may be obtained are indicated by color patterns.

The new index is available on request to the Geological Survey, Washington 25, D.C. or Denver 25, Colorado.

HANDBOOK - DIRECTORY, 1961

Herman R. Friis

Editor-in-Chief

ii and 192 pp., $4.00

Central Office, Association of American Geographers

1785 Massachusetts Ave., N.W.

Washington 6, D.C.

COMMUNICATIONS FROM READERS

CENTER OF POPULATION

Dear Editor:

On April 12, 1961, the *New York Times* and other leading newspapers published the report that the Secretary of Commerce, Luther H. Hodges, had announced that the Bureau of the Census had computed the center of population of the United States (according to the 1960 census) to be near Centralia, Illinois.

The Bureau thereby maintained a tradition started in the 1870's. Undoubtedly, this rather trivial bit of news attracted attention in some quarters and provided divertissement on a day of otherwise very gloomy news. Unfortunately, Secretary Hodges was armed with *wrong* definitions concerning the nature of this center. For example, it was alleged that, "the population center is the point through which a straight line can be drawn in any direction dividing the country's population in half. As many people would live on one side of the line as the other." Now, this is a patent absurdity. Not only is this not a proper definition of this particular center, but there can be *no* point whatsoever in the United States for which this statement is true. Although as many lines of different directions as desired can be drawn, each of which would halve the population, these lines would not all cross at a common point.

Secretary Hodges had another definition. This center is "the point to which all residents of the fifty states could go for a convention with the smallest possible total travel mileage." Although this is a proper definition for one kind of center of population, it is, alas, not the definition of the center that the Bureau of the Census happened to compute.

A preliminary survey at the American Geographical Society of New York of the 1960 census data shows that the actual center of smallest possible total travel mileage for the kind of convention Secretary Hodges imagines is in eastern Indiana (Randolph County), some 240 miles east-northeast of the Bureau of the Census' center of population. For every resident of the United States to attend such a convention would require a total of about 122 billion miles of straight line travel, or an arithmetic average of approximately 680 miles per person.

Not only have those in Washington in charge of population centers misconstrued the mathematical nature of the center they publicize, but they have also been victimized by the facility with which electronic computers grind out meaningless decimal places. To suppose that their center could be determined so exactly that a surveyor would be required to establish just where on a particular farm the center is located, ignores completely the lesser degree of accuracy in the data originally served up to the computers. Nevertheless, federal funds, derived from taxpayers, will be used to finance the placing of a marker at the "exact" spot determined by the Coast and Geodetic Survey.

In describing the center as he did, Secretary Hodges promulgated an ancient error which the Bureau of the Census has several times corrected only to fall into the same trap subsequently. Specifically, these errors are found in census publications from 1900 to 1924 although originally these matters were understood. Critics in 1902, and again in the late 1920's and 1930's, called attention to these errors. From 1940 until recently, the Bureau was again apparently in command of the situation, recognizing that their formula for calculating the center gave a balancing point analogous to a physical center of gravity or a statistical arithmetic mean center.

One can only hope now that what the Secretary of Commerce has said, and what the Bureau of the Census within his department knows, are two different things.

William Warntz
David S. Neft
American Geographical Society

NEW PUBLICATIONS

Rice: Domestic Consumption in the United States. PARLEY M. PRATT. Bureau of Business Research, The University of Texas. Austin. 1960. xxii and 217 pp. $4.00.

This monograph is primarily a report of a marketing survey of consumer buying habits and preferences made in Atlanta, Dallas, and Denver in 1957. A brief history in the first chapter summarizes the development of the rice industry in the United States. World production and international trade are also summarized, chiefly by means of graphs and tables. Climatic and soil conditions and the water requirements of rice are briefly stated in the second chapter, along with a treatment of milling, grading, and marketing of rice.

The volume utilizes two maps, four line graphs, and 119 tables, 67 of the latter being in the body of the text. One might prefer a dot distribution map of rice acreage in the United States to the one in which counties are shaded according to their total acreage regardless of great differences in the size of counties.

Rice consumption is analyzed in relation to size, income, and ethnic background of the families interviewed. Analysis by geographic location, based upon data from the three cities listed above, is weakened by the smallness of the sample.

Recommendations in the closing chapter include increased advertising, sales promotion, and more attractive packaging, as well as research and development of new and expanded uses of rice.

JAMES E. COLLIER
University of Missouri

Fundamentals of Population Study. T. LYNN SMITH. J.B. Lippincott Co. Chicago. 1960. xviii and 542 pp. illust. $6.75.

Although this book is an introductory college text written from the viewpoint of the demographer and sociologist, it should be of considerable interest to the population geographer. Professor Smith emphasizes that "The number of its inhabitants is the most important demographic fact about any area, large or small."

He has divided the book into six parts: Part One, The Nature and Development of Population Study; Part Two, Number and Distribution of the Population; Part Three, The Characteristics of Population; Part Four, The Vital Processes; Part Five, Migration; and Part Six, Growth of Population. These parts include 21 chapters, 90 illustrations consisting of maps and graphs, and 53 tables.

The special value of this book for the geographer lies in the provision of data to show, for each subject and insofar as is possible, comparisons between countries. For example, Table I gives the population, area, and density of most of the countries of the world according to most recent available censuses. The book also indicates, for the United States, variations between States and other areas.

Chapter 4, on Rural or Urban Residence, discusses census definitions of the term urban, and in Table III summarizes them for each of a large number of countries. Regional and State differences in the urban population of the United States are described, and trends since 1790 are analyzed.

In Chapter 5, Race, Color, Ethnic Stock, and Nativity, international comparisons are followed by a description of the geographic distribution of race and nativity groups in the United States. Among other maps are a series of dot maps showing distribution in the United States, in 1930, of immigrants from 23 foreign countries.

In other chapters, sex composition, marital condition, occupational status, and educational status are all covered in a similar manner.

The vital processes of birth and mortality, and the migration factor, are given detailed treatment because of their importance in understanding the growth of population. Improvements in data collected on births and deaths, in the world and in the United

States, are acknowledged; but the paucity of adequate data on emigration and immigration, and most especially on internal migration, is lamented.

Finally, under Part Six, The Growth of Population, attention is given to analysis of past trends, but little attention is paid to population projections or forecasts. Professor Smith states that because of "the independent variables which are responsible for changes in population (the dependent variable), the present writer is unwilling to spend very much time and effort in population forecasts or projections of any type."

ROBERT C. KLOVE
Bureau of the Census

The Galapagos Islands: A History of Their Exploration. JOSEPH R. SLEVIN. Occasional Papers of the California Academy of Sciences, No. XXV. San Francisco. 1959. x and 150 pp. illust. $3.75.

For all of the 53 years that he spent in research as a staff member of the California Academy of Sciences, Joseph Richard Slevin maintained an interest in the Galapagos Islands. This interest was first whetted by an intimate introduction to them in 1905 when, as a young man, he went with the expedition that made the most intensive survey ever achieved of the natural history of the archipelago.

Slevin's primary field was herpetology, and his enthusiasm for the Galapagos is readily understood when one remembers the unique giant land tortoises of the islands. However, in this last published of his works, he is mainly concerned with the general physical aspects of the islands and especially in the history of their use by men. Of little value to the Spaniards, the islands early became temporary bases for buccaneers and discoverers, including Drake, Davis, Dampier and Cook. Later, they served Pacific whalers, occasional navy vessels of many nations, sealers, and scientific expeditions; the most famous of the latter were those of H.M.S. Beagle with Darwin on board, and the Harvard Expedition in which Agassiz took part.

Geographers will be interested especially in the first 26 pages of the text, which describe physical traits of the islands, fauna, discovery, history of its cartography, and incidental details of other matters. Although they will not always be satisfied with either the details or the manner of handling and interpretation, nevertheless they will find material of interest and value.

DAN STANISLAWSKI
The University of Texas

Temperature and Wind Frequency Tables for North America and Greenland. Vol. 1, January-June; Vol. 2, July-December. J. N. RAYNER, ed. Arctic Meteorology Research Group. McGill University. Montreal. August, 1960.

These two volumes, publications numbered 24 and 25, were prepared for Headquarters, Quartermaster Research and Engineering Command, U.S. Army, Natick, Mass. They represent additions to four volumes already published, which presented climatic frequency data for Eurasia. This valuable source material will be the basis for a series of atlases, mapping the areal distributions of the frequency of the selected elements in Eurasia and North America (including Greenland). Along with the atlases, there will be a separate publication showing index of stations and giving a discussion of methods and problems encountered in the statistical treatment of the data.

These two volumes have tables arranged alphabetically by country and then by station; Alaska is treated as a country. The tables give temperature frequencies (number and per cent) in 5°F. classes, and wind speed frequencies (number and per cent) in miles per hour for each 5°F. temperature class.

These volumes supply authentic statistical data which should enable meteorologists, climatologists, as well as geographers, to devise some new, needed, and intriguing maps. The Natick Command and the McGill University research group deserve a vote of thanks for this stupendous job.

HENRY J. WARMAN
Clark University

Essentials of Earth History. WILLIAM LEE STOKES. Prentice-Hall, Inc. Englewood Cliffs, N.J. 1960. x and 502 pp. illust. $8.75.

With the passing years, textbooks on historical geology become more authoritatively

researched, more lucidly written, and more beautifully illustrated. The above book continues the trend. It is an up-to-date and fascinatingly told story of the history of Earth and the development of life on the planet.

Organizationally, Stokes' book follows the standardized pattern established by its predecessors in the field: introductory materials are succeeded by chapters devoted to a chronologically arranged analysis of the various geologic eras, and the book is concluded with, as one might logically expect, concluding chapters.

But this book differs, nevertheless, from earlier models in the more than ordinary amount of emphasis and space that is devoted to introductory and concluding materials. Indeed, only six of the 20 chapters, and less than one-half of the pages, are concerned with the normally predominant formal analysis of events during the various subdivisions of geological time. In place of these materials are chapters dealing with such subjects as Time and Its Measurement, The Uniformity of Change, Layered Rocks and the Law of Superposition, Fossils and the Succession of Life on Earth, The Dispersal and Migration of Species, The Fitness and Adaptability of Life, and Extinction and Replacement.

This emphasis on principles is admirable, especially for the geological neophyte. When such an approach is polygamously wedded to an interesting style and a modern content, it forms a union that is difficult to surpass. Modern geographers, many of whom are so exclusively concerned with Miss Earth *circa* 1961 or even *circa* 2000 A.D., might well use this book to strike up or renew an acquaintance with Dame Earth *circa* 500,000,000 or 1,000,000 B.C.!

G.F.D.

Principles of Petroleum Geology, 2nd edition. WILLIAM L. RUSSELL. McGraw-Hill Book Co., Inc. New York. 1960. xiii and 503 pp. illust. $9.50.

In a field as complex as petroleum geology, no one book can be more than a compendium and summary of present knowledge and theory. This is the second edition of a text that has become the standard work in its field. Each chapter has been up-dated and contains a wealth of new material in a rapidly growing field.

The book is comprehensive rather than detailed; its 29 chapters include every major facet of petroleum geology, but none is of sufficient depth to satisfy the advanced student. Major divisions include the characteristics of hydrocarbons, structures and reservoirs and pressures, origins and migration of petroleum, various types of well-logs, various geophysical methods of exploration, salt domes, continental shelves, and appraisal of oil prospects.

Particularly valuable is the author's thorough listing of references, about 45 per cent of which were published since 1950, and his presentation of recent theory and belief in controversial subjects. There is a tendency to take the most recent theory as the best; too often the author states that "X has found this to be so," without evaluating the statement further. Basically, the writer presents modern findings and conclusions fairly, without personal judgment as to their validity. Each chapter, then, is in itself a complete outline of the topic, with a wide selection of references provided for further study.

For the geographer, this excellent volume is of value chiefly as a reference work. There are no maps of large regions (but there are many oil field and structure diagrams), and no production tables. Only passing reference is made to foreign oil fields, as most of the research and theory is based on American practice. The book is well liked by geologists, and will answer many questions for economic geographers as well.

KARL STACEY
Kansas State University

Diversification of Manufacturing Employment for States and Metropolitan Areas. ROGER A. PRIOR AND MURRAY D. DESSEL. Area Trend Series, No. 5. Office of Area Development, U.S. Department of Commerce. Washington, D.C. 1960. vi and 21 pp. $0.25.

The purpose of this report is to supply background information that will facilitate appraisal of industrial diversification by presenting summary measures of manufacturing diversification for 48 states and the District of Columbia, and for 172 Standard

Metropolitan Statistical Areas, for 1947 and 1954. An index of diversification has been devised based on the deviation of the areas under consideration from the standard provided by the United States. For this index the standard is the percentage distribution of manufacturing employment among the 142 three-digit industry groups for the United States as a whole.

The data are presented in tables showing manufacturing employment diversification indexes for states and Standard Metropolitan Statistical Areas, relation between changes in manufacturing employment and diversification indexes of states and the 52 largest Standard Metropolitan Statistical Areas, comparison of changes in number of industry groups, and changes in diversification indexes for states and for the 52 largest Standard Metropolitan Statistical Areas.

The report reveals that the manufacturing economies of most states and Standard Metropolitan Statistical Areas became more diversified between 1947 and 1954. The rate of increase in diversification, however, was not closely correlated with the rate of growth in manufacturing employment during that period. Therefore, growth and diversification do not appear to be closely associated phenomena.

This is one of a series of studies being developed by the Office of Area Development that deserves the attention of geographers.

E. WILLARD MILLER
The Pennsylvania State University

Field Study in American Geography: The Development of Theory and Method Exemplified by Selections. ROBERT S. PLATT. Research Paper No. 61, Department of Geography, University of Chicago. University of Chicago Press. Chicago. 1959. vi and 405 pp. illust. $4.00.

This analysis of American geographical field study by one of its best known exemplifiers seeks to identify the several stages through which the subject has passed. To achieve his goal, the author utilizes a selection of "mile-post" studies done at different times and places. To Professor Platt, the evidence indicates that field study has developed progressively, that results have been cumulative and, when taken together, show ways toward ever better understanding of the raw phenomena with which field study deals.

Eight basic types of field procedure are recognized, the oldest, Journal of Exploratory Traverse, initiated by the Lewis and Clark reports of 1804-06. The youngest, the Geography of Culture Origin and Dispersal, has as its prototype Sauer and Brand's work on pueblo sites in southeastern Arizona of 1930. Derivatives of the basic types are found in 22 studies ranging in date from 1927 to 1957.

All eight major study types have developed since their inception, though in one important respect, namely selective landscape sketching, there has been a positive decline without a corresponding increase of skill in selective photography.

As Professor Platt candidly recognizes, "the arrangement of these studies is unorthodox and unprecedented and will have to be justified." Whether or not the arrangement has been justified will be left to individual judgment. In any event, Professor Platt is to be commended highly for assembling a most useful collection of field studies.

FRED KNIFFEN
Louisiana State University

Metropolis and Region. OTIS D. DUNCAN, WILLIAM R. SCOTT, STANLEY LIEBERSON, BEVERLY D. DUNCAN, AND HAL H. WINSBOROUGH. Published for Resources for the Future, Inc., by The Johns Hopkins Press. Baltimore. 1960. xvii and 587 pp. illust. $8.50.

This is the best conceptual and empirical cross-section view of American metropolitan centers now available. The first one-half of the book presents the conceptual basis for the cross-section analysis of example metropolises. A group of five chapters provides certain systematic ideas on the functioning of the metropolis. Classical notions of location and function are reviewed, as is the notion of the urban hierarchy. Financial, manufacturing, and commercial criteria for the recognition of metropolises are noted. Special attention is given to financial functions, and the case of interregional flows of funds is used to illustrate metropolitan interrelations. Relations of activities in the hinterlands of metropolitan areas — manufacturing, coal mining, and agriculture — and metropolitan dominance are the sub-

ject of two chapters. The remaining three chapters of this part of the book give the rationale behind the classification used in the cross-section analysis of 50 metropolitan areas.

The last one-half of the volume presents the chief features of 50 of the nation's larger metropolitan areas, arranged in groups – Diversified Manufacturing with Metropolitan Functions; Regional Metropolises; Regional Capitals; Diversified Manufacturing Centers; Specialized Manufacturing; and Special Cases. Inputs and supply areas are discussed for so-called profile industries in each metropolis, as are outputs and service (trade) areas. A succinct summary is given for each center. These descriptions are based chiefly on materials in periodical and textbook literature, and in government documents.

WILLIAM L. GARRISON
Northwestern University

George Perkins Marsh: Versatile Vermonter. DAVID LOWENTHAL. Columbia University Press. New York. 1958. x and 442 pp. illust. $6.50.

This book is a biography of George Perkins Marsh, who in turn was the author of *Man and Nature,* the most important and original American geographical publication of the 19th century.

The author of this biography has presented such a wealth of material of interest to geographers that only a selected few of his contributions may be mentioned here. He presents a concise and inclusive summary of the contents of Marsh's *Man and Nature.* He establishes, also, the fact that although the central theme of *Man and Nature* was first presented by Marsh in a lecture in 1847 it was not until 1863 that he actually settled down to write the volume which he completed in 1864.

Lowenthal's main contribution is his analysis of Marsh's life experiences from which evolved the content of *Man and Nature.* The narration unfolds the story of Marsh's childhood upbringing which included, as early as the age of five years, studies of the interrelations between man and nature under the tutelage of his father. The author continues to present the activities, experiences, and events of Marsh's adult life as a 19th century landowner, farmer, lawyer, editor, manufacturer, linguist, philologist, politician, and diplomat, each of which careers influenced the character of his work.

The author of *George Perkins Marsh* has produced a scholarly and timely study. His research has been thorough and lends authenticity to his book.

FLORENCE M. WOODWARD
University of Vermont

Methods of Regional Analysis; An Introduction to Regional Science. WALTER ISARD and associates. Massachusetts Institute of Technology and John Wiley and Sons, Inc. New York. 1960. xxix and 784 pp. illust. $9.50.

The content of this volume is well described by the first portion of its title: it is indeed a splendid review of the techniques and methods that the authors have found most successful in their studies of the locations and spatial arrangements of economic and social phenomena. There is room for some doubt, however, as to the descriptive adequacy of the second portion of the title, since the volume is devoted exclusively to problems of measurement and does not introduce the various facets of location theory with which regional science is concerned.

Geographers, particularly those whose interests involve the quantitative aspects of economic geography, will welcome this assemblage of a considerable number of useful techniques in a single volume. Certainly there is no other single source in which an investigator may find adequate and useful descriptions of such diverse analytical procedures as areal income estimation, flow analysis, multipliers, input-output, measurement and analysis of industrial location, linear programming, and gravity models. A final chapter, Channels of Synthesis, should be especially interesting to geographers whose concern is mainly with the patterns of interaction which form the social content of areas. Devices for measuring the character and importance of inter-relationships among various aspects of the social milieu are presented especially well in this volume. The particular merit of most of these devices is that they permit examination of individual phases of that development in the context of the social situations in which they occur. Thus, the techniques that are suggested give promise

of considerably more realistic approaches to the social aspects of the problems of area analysis than were available a few short years ago. Fulfillment of this promise certainly would provide valuable assistance in the solution of problems with which the discipline of geography has long been concerned.

We should not be encouraged, however, to expect miracles. Procedures described in *Methods of Regional Analysis* appear to be capable, when properly applied, of providing us with the most comprehensive and most useful descriptions of the spatial aspects of social life that have ever been developed; but they must be recognized as yielding data for only a partial analysis, an analysis that does not as yet contemplate adequate descriptions of the operations of large numbers of physical and human factors which have not yet been entered in the equations and other mathematical and statistical formulations which comprise the working mechanisms of these procedures. There is good reason to believe, however, that the various systems of measurement may ultimately be expanded to encompass the entire span of human and physical features. Geographers who envision a need for these kinds of information will find encouragement in the present volume.

H.H. MCCARTY
State University of Iowa

Orbis Geographicus, 1960; World Directory of Geography. E. MEYNEN, ed. and compiler. Issued by the International Geographical Union. Franz Steiner Verlag. Wiesbaden, Germany. 1960. 605 pp. 32 DM.

This new directory replaces the *World Directory of Geographers*, published by the International Geographical Union on the occasion of the 17th International Geographical Congress in Washington, D.C. in 1952, and long since much out of date.

The directory includes the following parts: (1) a list of medals awarded by all the principal geographical societies, and their recipients if deceased; (2) history, statutes, officers, and organization of the International Geographical Union; (3) names and addresses of geographical societies, cartographical societies, departments of geography, polar institutes, governmental geographical agencies, hydrographic offices, and cartographic offices; (4) a directory of geographers, listed by country; and (5) a single alphabetical index of geographers listed.

Orbis Geographicus includes 4,003 geographers, 418 departments of geography in universities, 152 geographical societies, and 603 governmental departments with geographic functions. It lists 931 geographers from the United States, 360 from the United Kingdom, 357 from Germany, 279 from Japan, and 109 from Canada.

Naturally, in a volume of this scope, omissions will occur; but the directory reveals careful planning, an immense amount of work, and scrupulous editing. It is a reference book that should be in any serious geographic library, as it is likely to be referred to frequently over the years for information on geographers and geographical centers. Professor Meynen has rendered a great service to the profession in preparing this volume.

CHAUNCY D. HARRIS
The University of Chicago

The American Counties: A Record of the Names of the 3,067 Counties, Dates of Creation and Organization, Area, Population, Historical Data, Etc. JOSEPH NATHAN KANE. The Scarecrow Press, Inc. New York. 1960. viii and 492 pp. $11.00.

This useful reference work will be of interest to students of onomastics and American historical geography, as well as to anyone who has occasion to make much use of county data. Following a brief preface and an introductory chapter analyzing the sources of American county names, there is a 251-page master table listing each of the 3,067 present day counties alphabetically and stating the date of its creation, its land area, 1950 population, county seat, and the origin of its name. In those cases where the aboriginal term or person after whom the county was named is obscure, there is a brief, but enlightening, biographical or etymological statement.

Five shorter tables list counties by states and chronologically by date of formation, give former names of counties that have undergone name changes, and furnish alphabetical lists of county seats and of indi-

viduals after whom counties have been named. These tables are basically rearrangements of the master table, except for the introduction of material on name changes and citations of statutes organizing the counties.

As the best single compendium of basic facts concerning American counties, this volume merits space in any reference library; and Kane appears to have performed an exemplary job within his stated aims. Unfortunately, some major deficiencies must be noted. There are no maps or bibliographical citations; there is no information on the numerous, and often baffling, boundary changes various counties have undergone; and some dozens of extinct counties are not mentioned. Consequently, it will still be necessary for anyone concerned with shifts in names, identities, and boundaries of many of our American counties to search through an imposing stack of older census bulletins in order to secure these facts.

WILBUR ZELINSKY
Southern Illinois University

Handbook of Latin American Studies: No. 22. N. A. HAVERSTOCK, ed. University of Florida Press. Gainesville. 1960. xiii and 378 pp. $12.50.

This is not a book to be read; it is one to be used. As a unique bibliographical source, it should prove of significant value to geographers interested in Latin America. The *Handbook* is a selective, annotated guide to materials published primarily between 1957-1959. The approximately 3,500 entries, representing contributions in 15 languages, are chosen from over 500 journals and 2,500 monographic studies. Of the articles reviewed, 255 are geographical in nature and are drawn from 91 different periodicals. The number of geographical entries for each major area are as follows: Caribbean – 2, Colombia – 10, Middle America – 17, Venezuela – 16, West Indies – 12, Argentina – 37, Bolivia – 3, Chile – 28, Ecuador – 10. Paraguay – 1, Peru – 29, Uruguay – 6, Brazil – 63, and general – 21. Fields other than geography that are covered include anthropology, art, economics, education, government, history, international relations, language, law, literature, music, philosophy, sociology, and travel.

In addition to reviews, the *Handbook* contains brief statements in each field concerning basic and significant trends, notable works, and recent activities of scholarly interest. The Geography Section includes comments by R.E. Crist on the Caribbean, G.M. McBride and R.C. Eidt on South America, and P.E. James and H.O. Sternberg on Brazil. This volume, unlike its predecessors (Nos. 1-13, published by Harvard University; Nos. 14-21, published by the University of Florida), has expanded its coverage of material published outside the Americas. It has not, regrettably, expanded to take in more material appearing in North American journals and monographs. Only about 10 per cent of the geographical articles reviewed were written by persons living north of the Rio Grande. Though the *Geographical Review* is reasonably well represented (with three articles reviewed) and *Focus* (two articles), the *Annals of the Association of American Geographers* has only one article reviewed, and *The Professional Geographer* has none. Without bias, one only can ponder why the leading professional journals in the United States have published no more than four worthwhile articles on Latin America since 1957!

Dozens upon dozens of excellent journal and monographic articles in North American periodicals were overlooked, apparently with intent. And the proposition that only so-called quality articles were reviewed is without basis. For example, there is no mention of Robert West's *Pacific Lowlands of Colombia*, nor of L. Guzman's *Farming and Farmlands in Panama*. These are excellent geographic monographs. Luella Dambaugh is a prolific writer on Latin America, but not one of her articles is cited. This reviewer could list several hundred good, sound articles pertaining to Latin America if he were called upon to do so, and he finds it more than perplexing that they were omitted from the *Handbook*.

Geography also receives an unbalanced treatment. There is not a single reference to the Guianas, and Mexico merits only four summaries. This may be compared with 63 from Brazil. Does this possibly reflect a prejudice on the part of the Contributing Editors? Brazil furnished such an Editor in Geography; Mexico and the Guianas did not.

Geography is not alone among the

slighted. The Anthropology Section totally neglects the writings of R. McGimsey; yet, it was he who reported in 1958 on the Cerro Mangote site in Panama, the first truly pre-ceramic culture in that area and one that might upset the entire regional scheme of sequent occupance and previous dating. And why does not the Government Section treat W. Clegern's study of the Guatemala-British Honduras boundary dispute? Or was it History that omitted this? Or was the subject too delicate for either?

Despite the above statements, the *Handbook* is still of value if used with caution. Some 255 geographical references are certainly worth having at one's fingertips, even though they constitute primarily a bibliography of foreign writings. If this reviewer's opinions reflect a deep-rooted personal bias, and if North Americans have indeed produced only a handful of worthwhile writings on Latin America since 1957, then we must admit that no area on earth has ever been so neglected. The question then becomes: shall we do more Latin American research in this country and see that it is published, or shall we publish a bibliography that tells the true story of our work in recent years?

ROBERT H. FUSON
The University of South Florida

Chicago Area Transportation Study, Vol. I, Survey Findings. Chicago Area Transportation Study. Chicago. December 1959. xiii and 126 pp. illust. $4.00.

Chicago Area Transportation Study, Vol. II, Data Projections. Chicago Area Transportation Study. Chicago. July 1960. xi and 133 pp. illust. $4.00.

Single copies of both publications will be sent gratis to individuals and organizations in Illinois, Indiana, and Wisconsin within a radius of 50 miles of Chicago. Address request to Chicago Area Transportation Study, 4812 W. Madison St., Chicago 44, Ill.

The Chicago Area Transportation Study is the most comprehensive study yet made of the dynamics of an American metropolitan area. Financed by Federal, State, County, and City governments, it is one of a series of comprehensive metropolitan transportation planning studies designed to provide basic information prerequisite to formulation of comprehensive plans for circulation. The Chicago report is in three volumes, of which the third, to contain specific highway and transit route recommendations, is now in preparation.

Unlike most earlier origin-destination studies, this one projects future travel patterns and volumes on the basis of (1) past and present trip generation by various types, (2) densities and patterns of land uses within the study area, and (3) projected changes in population and economic status. The study involves analysis of a three per cent sample of over ten million trips to and from, and within, the study area of 1,370 square miles. Many new techniques are developed for the study, including an electronic scanning device, the cartographation, which is designed especially to produce map traces of desired lines in the form of light patterns, variations in intensity of which are proportional to traffic volumes.

HAROLD M. MAYER
The University of Chicago

The Wind from the North: The Life of Henry the Navigator. ERNLE BRADFORD. Harcourt, Brace and Company. New York. 1960. ix and 277 pp. $5.00.

Dom Henrique The Navigator. COSTA BROCHADO, VITORINO NEMESIO, FATHER MAURICIO, S.J., JOAQUIM BENSAUDE, DAMIAO PERES, TEIXEIRA DA MOTA, AND FREDERICO MARJAY. GEORGE F.W. DYKES, translator. Under the patronage of the Executive Committee for the Quincentenary Commemorations of the Death of the Infante Dom Henrique. Lisbon. 1960. 96 pp. illust. About $11.00.

The year 1960 was a gala one for the Portuguese, with a succession of festivities, meetings, exhibitions, and an International Congress of the History of the Discoveries – all in honor of their great national hero, Prince Henry, known as The Navigator. These two books, so widely different, do homage to him and to his navigators. "To him, more than to any other individual, we owe the direction the world was to take in the succeeding five hundred years."

Ernle Bradford has written a glowing biography of the famous son of King Joao I of Portugal and his English Queen, Philippa of Lancaster, daughter of John of Gaunt. Showing evidence of extensive research, with a list of sources and supplementary notes to each of the 27 chapters, the author traces the history of these stirring times and of this remarkable man. He died in 1460, at the age of 67, after a life dedicated to exploring the west coast of Africa and the penetration of strange seas. He fought against medieval superstitions and ancient concepts of a limited world, and encouraged his captains to sail ever south and penetrate the dreaded Sea of Darkness. He established a center at Sagres to study new and better methods of ship-building and navigation, devised and experimented with new instruments, and surrounded himself with the best brains of Europe – astronomers, cartographers (to correlate the information brought back by his ships), and cosmographers. A true geographer, Prince Henry utilized factors of similar climate and soil in colonizing the newly discovered islands of Madeira, introducing sugar cane from Sicily and malvasia grapes from Crete – the same grapes which are now the source of the celebrated Madeira wine. It it difficult to find a subject in which this incredible man was not interested.

The second book, a commemorative volume issued by the Portuguese Government and distributed to delegates at the International Congress in Lisbon in September 1960, is an artistic triumph. Superb photographs of areas sacred to the memory of Dom Henrique, reproductions of early prints, and portions and details from ancient maps all create a vivid picture of those exciting times. The seven distinguished authors each contribute a section of the text, discussing specific periods and events covering Europe in relation to Portugal. The conquest of Ceuta in 1415 (incidentally, this is the first recorded instance in which a model was used in planning a campaign), which provided the first European base on the continent of Africa, and the fiasco against Tangier in 1437, are given separate chapters. Commander Teixeira da Mota discusses the birth of astronomical navigation in the Atlantic, providing the key to oceanic exploration. The contents of this book deal with many incidences occurring long after the death of Prince Henry, but for which he laid the foundations. History owes Prince Henry a debt of gratitude, and these two books will help to keep alive his indomitable spirit.

ENA L. YONGE
American Geographical Society

The McGraw-Hill Illustrated World Geography. FRANK DEBENHAM AND WILLIAM A. BURNS, eds. McGraw-Hill Book Company, Inc. New York. 1960. xvi and 519 pp. illust. $15.00.

The title of this volume might indicate that it is a textbook in world geography, which it is not. Instead, it is an exceptionally attractive reference work, designed primarily for the layman rather than for the professional geographer. However, geographers will find a wealth of up-to-date and useful information in the book.

The publication is organized in encyclopedic style, with countries arranged alphabetically by continents and treated under a standardized list of topics, all of which makes for easy reference. Headings for topics are printed in red which further facilitates use of the book. One or more maps are included with each country, showing primarily place names, railroads, highways, main crop regions, and mineral resources. There is a profusion of well-chosen black and white photographs as well as 31 full color plates.

In addition to the discussions of countries, there are sections devoted to such items as definitions of geographic terminology; lists of the biggest, highest, longest, and deepest geographic features; an index; and 25 colored physical-political maps of continents and parts of continents.

P.R.G.

Natural Resources in Low Income Countries: An Analytical Survey of Socio-Economic Research. JALEEL AHMAD. University of Pittsburgh Press. Pittsburgh. 1960. xxv and 118 pp. $2.50.

In *Natural Resources in Low Income Countries,* Jaleel Ahmad has produced, under the direction of Milton Esman, a searching review of recent studies on the physical resources and institutional characteristics of underdeveloped economies which

should prove most useful to investigators concerned with resource utilization and integration in low income countries.

Ahmad and Esman point out, in the Introduction, that there is now a sizeable collection of technical reports on resource measurement and use which reflects concern of public authorities with basic data for rational resource development. A deficiency is noted, however, in the field of economic feasibility studies and competent resource analyses.

The major significance of Ahmad's report lies in its nearly 500 annotated citations to general and specific resource investigations. References are categorized under four major headings: Natural Resources-General, Land and Water, Energy, and Minerals; and entries under each heading are organized on a country basis. Examples of entries under Land and Water are such items as Development of Water Resources in the Lower Mekong, and Reconnaissance Soil Survey of the Coastal Plain of British Guiana. Under the heading Minerals will be found references such as The Development of Iron, Steel, and Non-Ferrous Industries in Taiwan.

It is significant that most of the reports cited are sponsored by official national or international agencies, and are authorized for the purpose of providing basic data for policy and program formulation. The reports are characterized by high professional and technical standards. Scholars concerned with the methodology now applied in the examination of national and regional resource potentials of underdeveloped countries are well advised to consult this publication; it will lead them to many obscure but valuable studies.

LOUIS E. GUZMAN
San Fernando Valley State College

Analogs of Canal Zone Climate in the Far East: Canal Zone Analogs IX. ROBERT L. ANSTEY. Technical Report EP-141. Quartermaster Research and Engineering Center, Environmental Protection Research Division. Natick, Massachusetts. October 1960. iv and 26 pp., plus 14 unpaginated maps.

This is the ninth report in a series comparing various tropical areas with Cristobal and Balboa Heights, Canal Zone. The area here compared includes parts of China, Japan, and Korea, generally south of the 42nd parallel and north and east of the 102nd meridian, as well as Macao, Hong Kong, Okinawa, Formosa, and neighboring islands.

As with previous studies, certain significant climatic elements were selected, compared, and mapped. Since, as might be expected, the character of the climatic controls is quite different in this portion of the Far East, areas of complete climatic analogy to either Balboa Heights or Cristobal are lacking. Everywhere, mean winter temperatures are too low for adequate correlation; yet, mean summer temperatures over a large part of the area are closely analogous to both Balboa Heights and Cristobal.

Maps depicting mean wind speeds and mean precipitation for the wettest month, and maps showing mean daily maximum temperature and mean daily temperature range of the warmest month, indicate that better correlation exists with Balboa Heights than with Cristobal in nearly all the lowland portions of the study. Only small areas are analogous to Cristobal. Many lowland areas also have mean annual precipitation amounts closely analogous to Balboa Heights, but only five areas on the southern coast of Japan and the Ryukyu Islands north of Okinawa have mean annual precipitation amounts which are closely analogous to Cristobal.

ROBERT M. BASILE
The Ohio State University

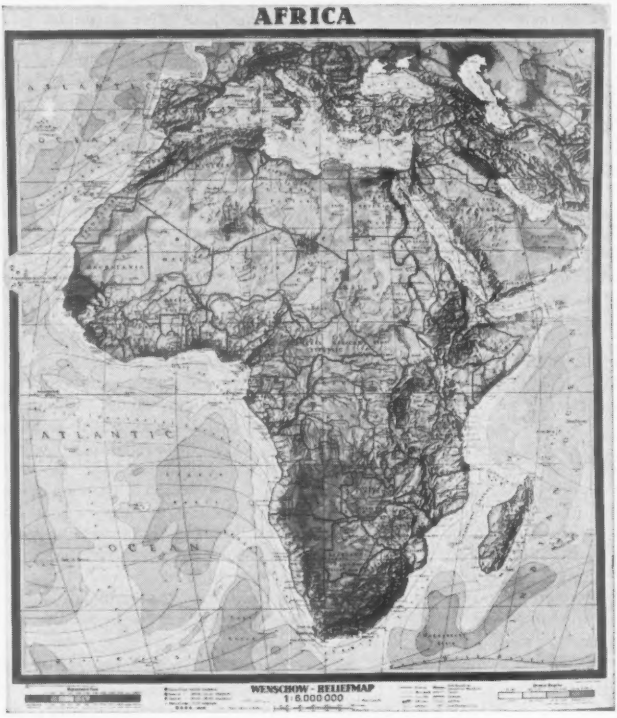
A Regional Geography, Part V, Europe and the Mediterranean, 9th edition. L. DUDLEY STAMP. Longmans, Green and Company, Inc. New York. 1960. viii and 336 pp. illust. $4.75.

Although the text of this edition has not been materially changed, the tables have been brought up to date and new trade diagrams have been prepared for the volume. Also, cognizance is taken of political changes such as those involving Cyprus, North Africa, the Saar, Syria, and Trieste.

Anyone who is familiar with the University Geographical Series, of which this book is a part, will welcome the new edition. For those geographers, if any, who have not been introduced to these compact little geography books, the reviewer suggests that they will find it worthwhile to make their acquaintance.

P.R.G.

The Latest Map of Africa!



RL4 Africa, 95 miles per inch, 64x75″

NET PRICES, Handmounted on Muslin

RL4-10 Plain wood rods ..... **$21.25** **RL4-15** In octagon steel case **$29.00**
RL4-14 Spring roller, board **27.25** **RL4-1D** Dissected to fold **25.25**

NEW! For Individual Student Use

These maps show conditions as of Feb. 1, 1961, list independent nations of Africa and the year of their independence.

No. 8004auf, 11x16″. Outline blue with names of countries Envp. of 50, **$4.00**
No. SR4auf, 9x11″. Politically colored with names ..... Envp. of 50, **4.00**

Send orders to

DENOYER-GEPPERT COMPANY

Publishers • Importers • Exporters • Map Mounters

5235 Ravenswood Avenue **Chicago 40, Illinois**